



## AT OBSTACLES

FOR MULTIPLE OBSTACLES - SPECIFY VAR. IN 12'-6" INCREMENTS.

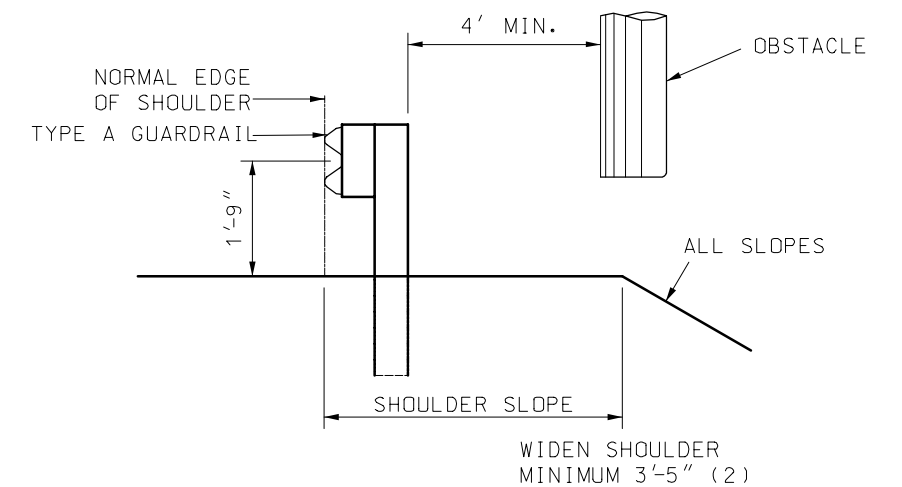
## GUARDRAIL LOCATIONS

### LEGEND

The diagram illustrates the layout of a bridge and its approach sections. It includes a central bridge section, bridge anchor sections on both ends, and ramps connecting to a cross road. Key features and dimensions are labeled:

- BRIDGE**: The main span of the bridge.
- BRIDGE ANCHOR SECTION**: The sections at either end of the bridge that anchor it into the ground.
- SHOULDER LINE**: The boundary line between the bridge deck and the shoulder.
- RAMP**: The approach sections that lead up to the bridge from the cross road.
- CROSS ROAD**: The road that crosses the bridge.
- (1)**: A dimension line indicating the length of the bridge deck.
- VAR**: A dimension line indicating the length of the bridge anchor section.

## BRIDGE ENDS GUARDRAIL LOCATION AT INTERCHANGE

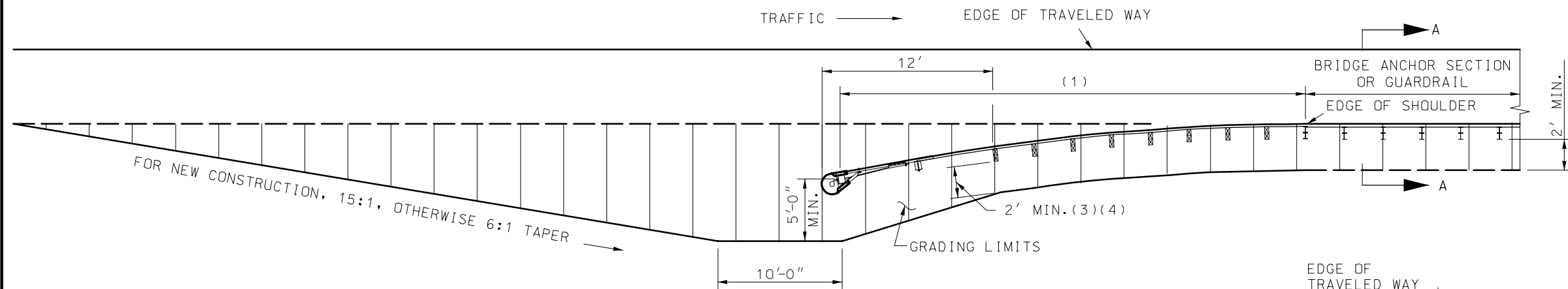


## LOCATION OTHER THAN C MEDIAN

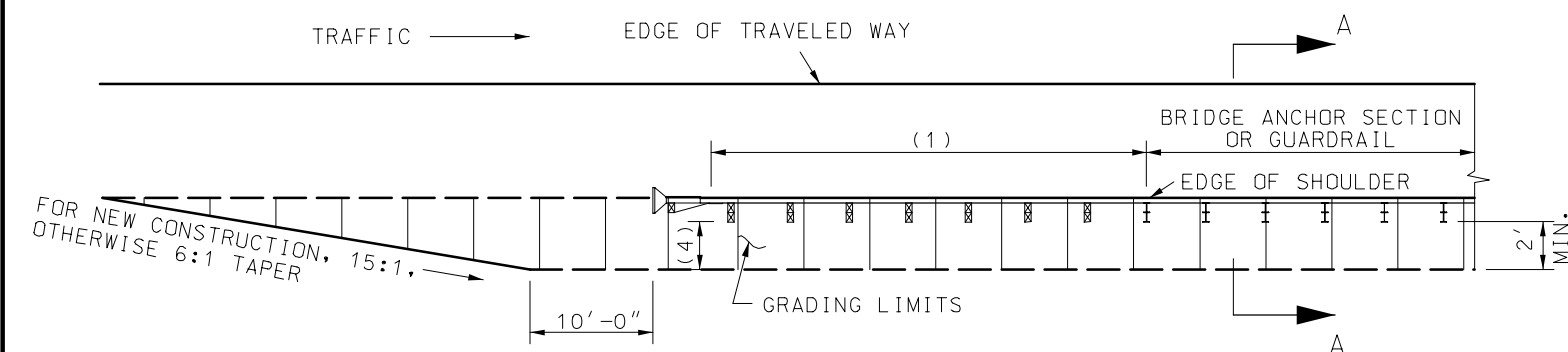
## LATERAL PLACEMENT OF GUARDRAIL FOR SHOULDER INSTALLATION

- (1) APPROVED TYPE A CRASHWORTHY END TERMINAL.
- (2) SHOULDER WIDENING SHALL CONSIST OF EMBANKMENT MATERIAL COMPACTED IN ACCORDANCE WITH SECTION 203.4 OF THE STANDARD SPECIFICATIONS.
- (3) WHEN GUARDRAIL IS CONSTRUCTED OVER CURBS, THE CURBS SHALL BE CONSTRUCTED AS SHOWN.

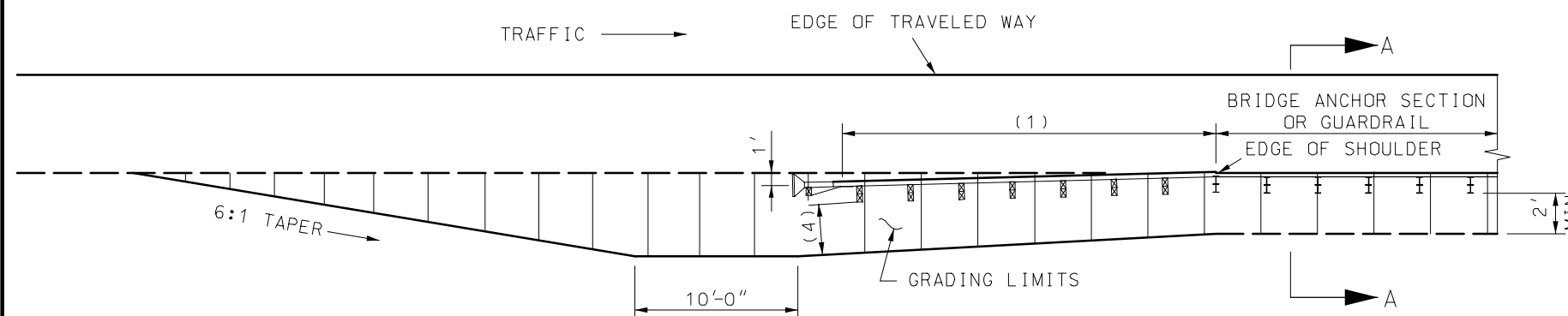
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
	GUARDRAIL		
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	1 16



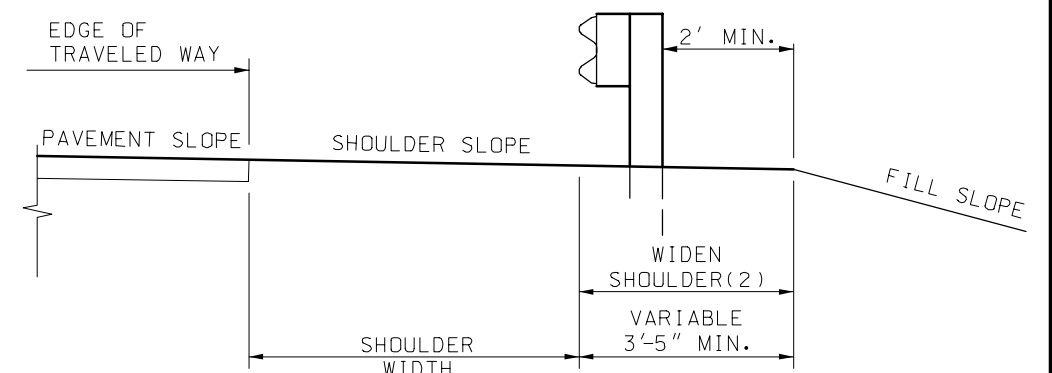
**GRADING LIMITS FOR TYPE A FLARED CRASHWORTHY END TERMINAL**



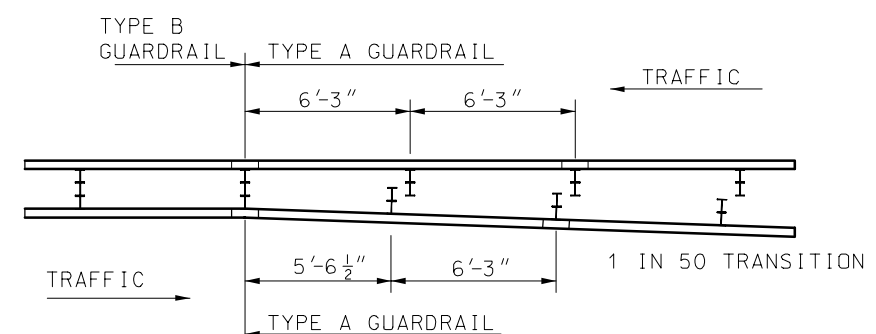
**GRADING LIMITS FOR TYPE A NON-FLARED CRASHWORTHY END TERMINAL**



**GRADING LIMITS FOR TYPE A NON-FLARED OFFSET CRASHWORTHY END TERMINAL**



**SECTION A-A**



**DETAIL FOR TRANSITIONING  
BETWEEN TYPE A AND TYPE B GUARDRAIL**

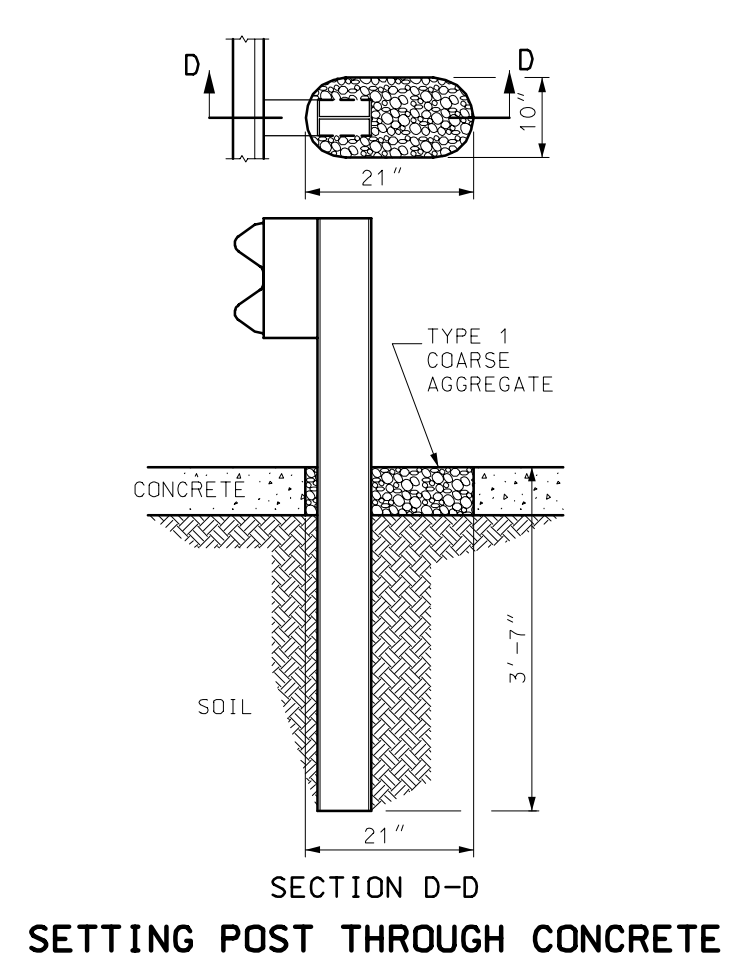
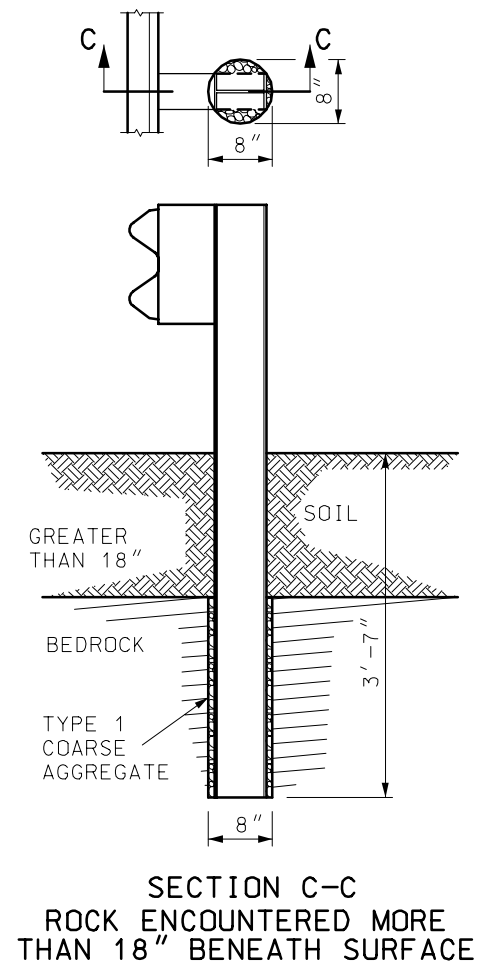
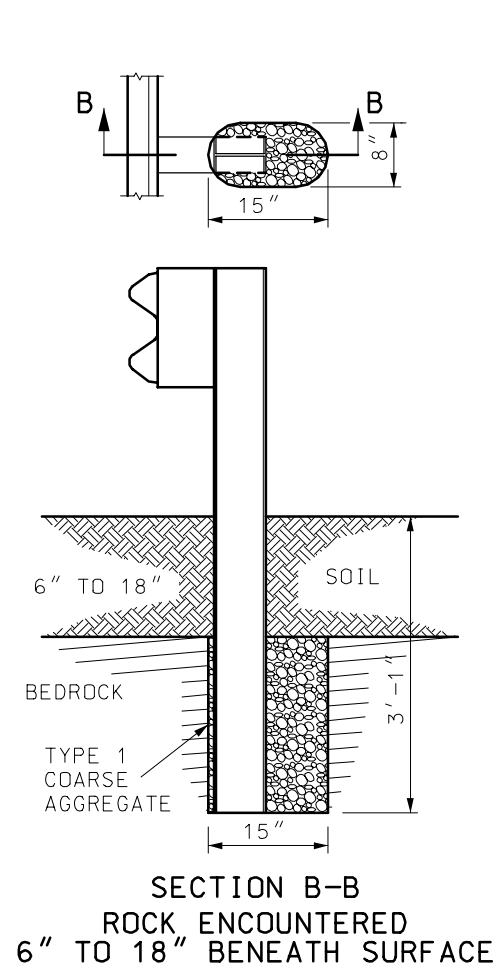
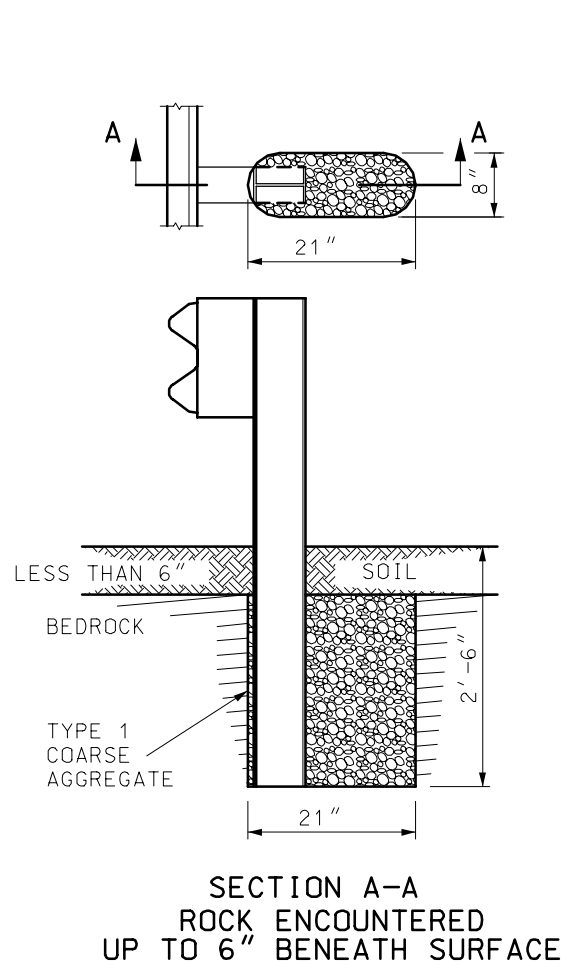
**GENERAL NOTES:**

THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH APPROVED SHOP DRAWINGS OF THE APPROVED CRASHWORTHY END TERMINAL.

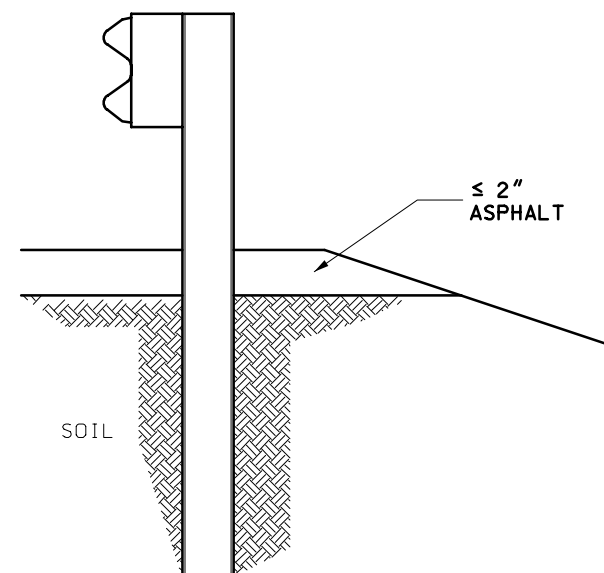
END ANCHORS SHALL BE INSTALLED ON ENDS OF GUARDRAIL RUNS WHERE CRASHWORTHY END TERMINAL IS NOT REQUIRED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<b>GUARDRAIL</b>			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	2/16

- (1) APPROVED TYPE A CRASHWORTHY END TERMINAL.
- (2) SHOULDER WIDENING SHALL CONSIST OF EMBANKMENT MATERIAL COMPACTED IN ACCORDANCE WITH SECTION 203.4 OF THE STANDARD SPECIFICATIONS.
- (3) THE SLOPE SHOULD BREAK BEHIND THIRD POST.
- (4) AS PER MANUFACTURER'S SPECIFICATIONS, 2' MINIMUM. NO DIRECT PAY.



## SETTING POST IN SOLID ROCK

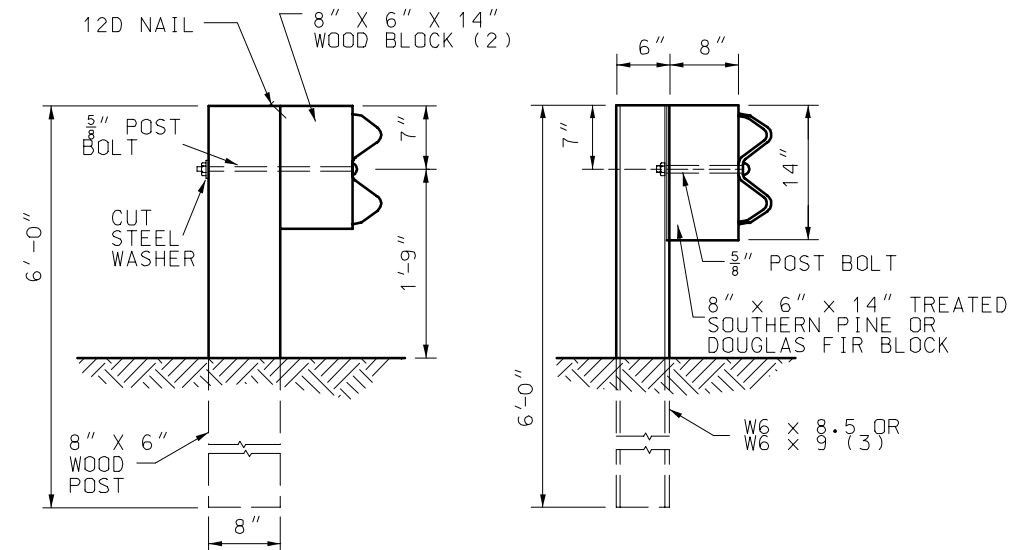


### GENERAL NOTES:

HOLES IN SOLID ROCK SHALL PROVIDE A DIAMETER OF NOT LESS THAN 4 INCHES GREATER THAN THE MAXIMUM TRANSVERSE DIMENSION OF THE POST SECTION.

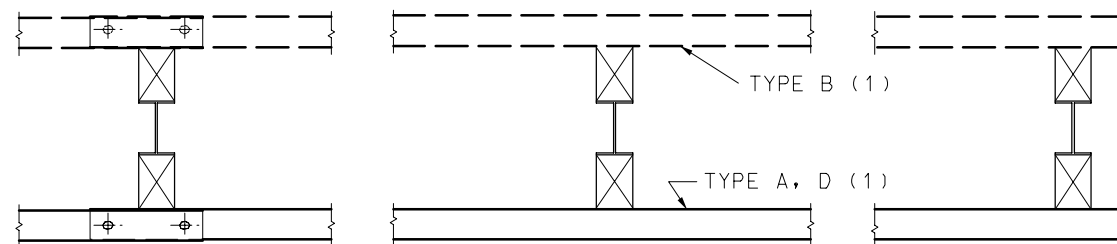
POST MAY BE SHORTER WHERE PLACED IN 2 FEET OF SOLID ROCK. STEEL POSTS MAY BE FLAME OR SAW CUT. REPAIR OF CUT SHALL BE IN ACCORDANCE WITH SECTION 712 OF THE STANDARD SPECIFICATIONS.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<b>GUARDRAIL</b> <b>SETTING POST IN SOLID ROCK AND THROUGH CONCRETE OR ASPHALT</b>			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	3/16

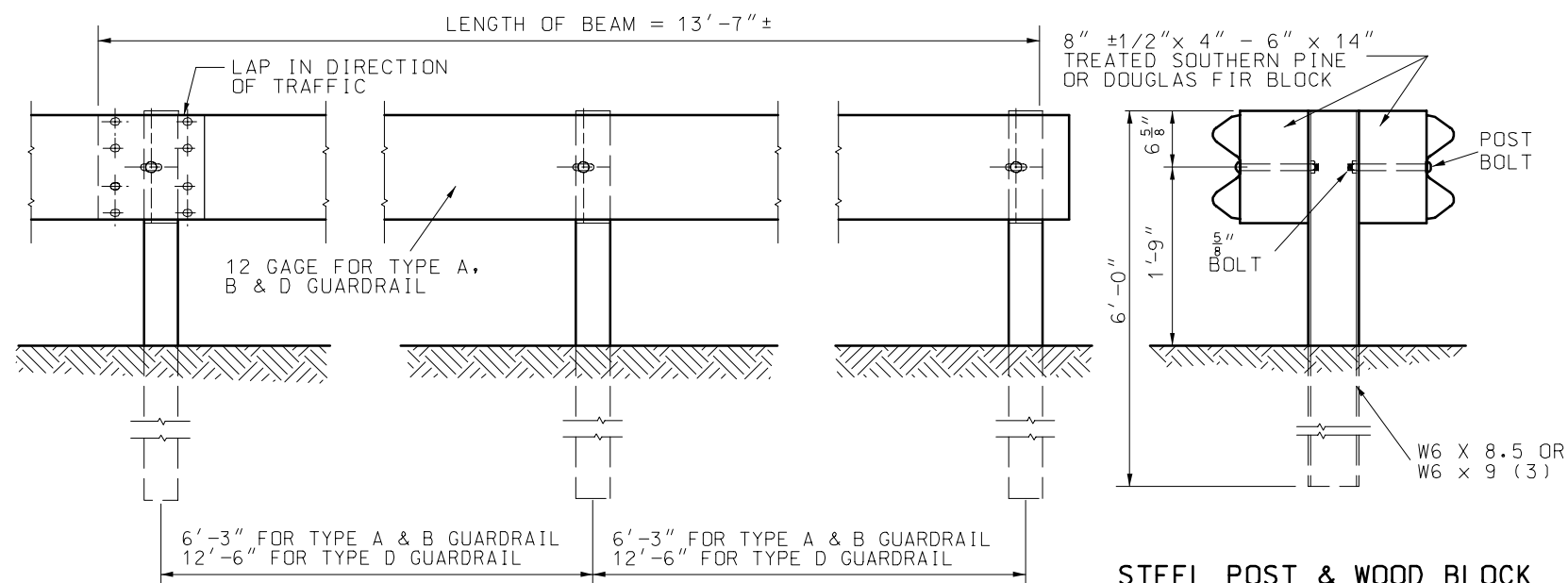


**WOOD POST AND WOOD OR PLASTIC BLOCK**  
**STEEL POST AND WOOD OR PLASTIC BLOCK**  
**TYPE A AND D GUARDRAIL**

- (1) END TREATMENT AS SPECIFIED ON PLANS.
- (2) AN ALTERNATE DESIGN, AN 8" X 4" X 14" WOOD BLOCK, MAY BE USED
- (3) THE CONTRACTOR MAY FURNISH EQUIVALENT SECTIONS FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH SECTION 1040.



**PLAN**



**ELEVATION**

**STEEL POST & WOOD BLOCK**

**TYPE B GUARDRAIL**

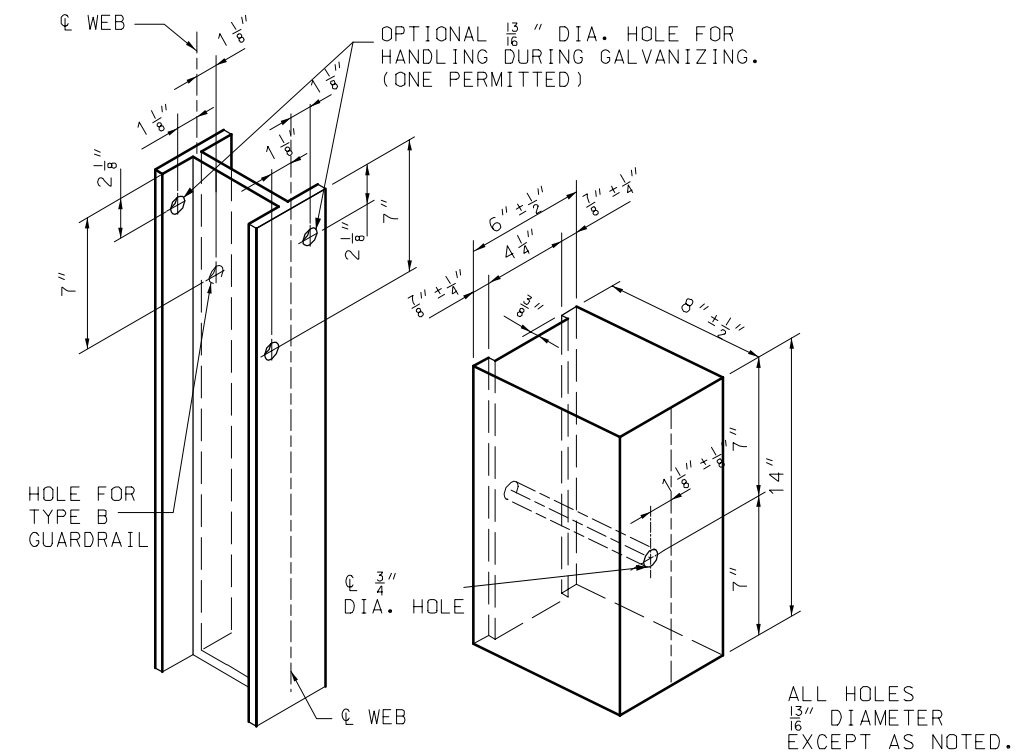
NOTE:  
 FOR TYPE E GUARDRAIL AND TRANSITION  
 DETAILS SEE SHEET 7 OF 15.

**GENERAL NOTES:**

WASHERS SHALL BE OMITTED ON ALL CONNECTIONS ON TYPE A, B AND D GUARDRAIL.

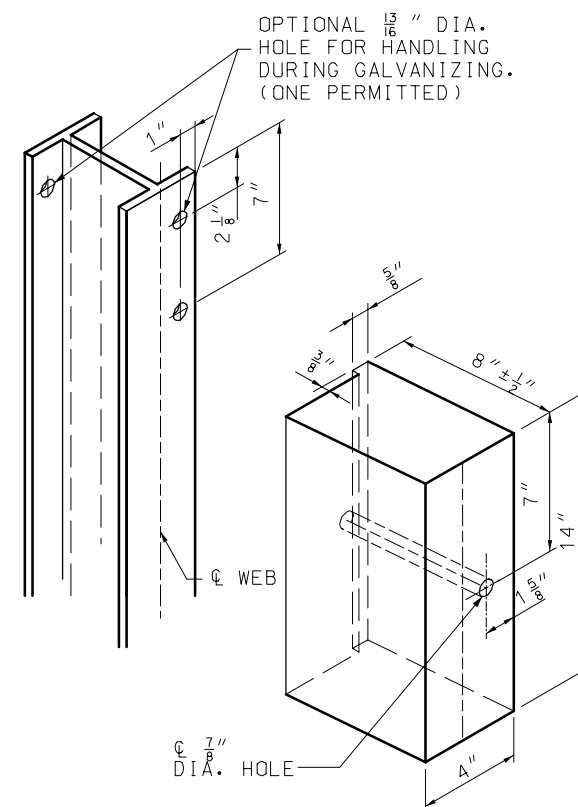
ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<b>GUARDRAIL TYPES A, B &amp; D</b>			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	4/16



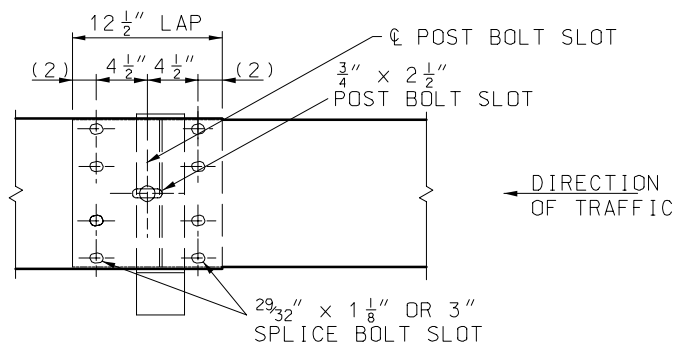
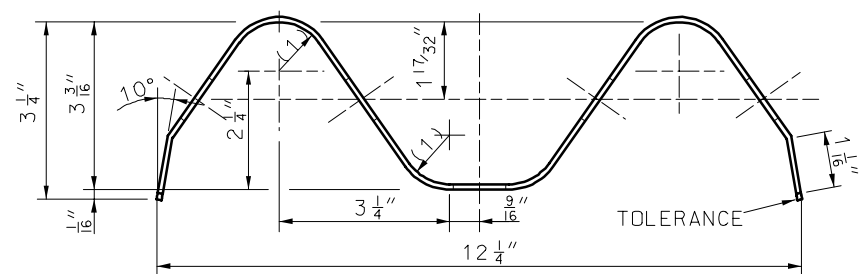
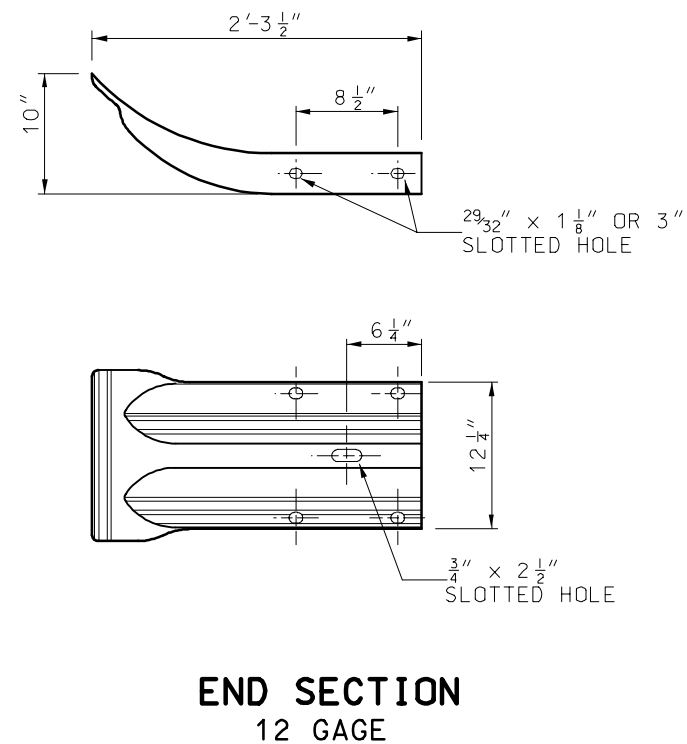
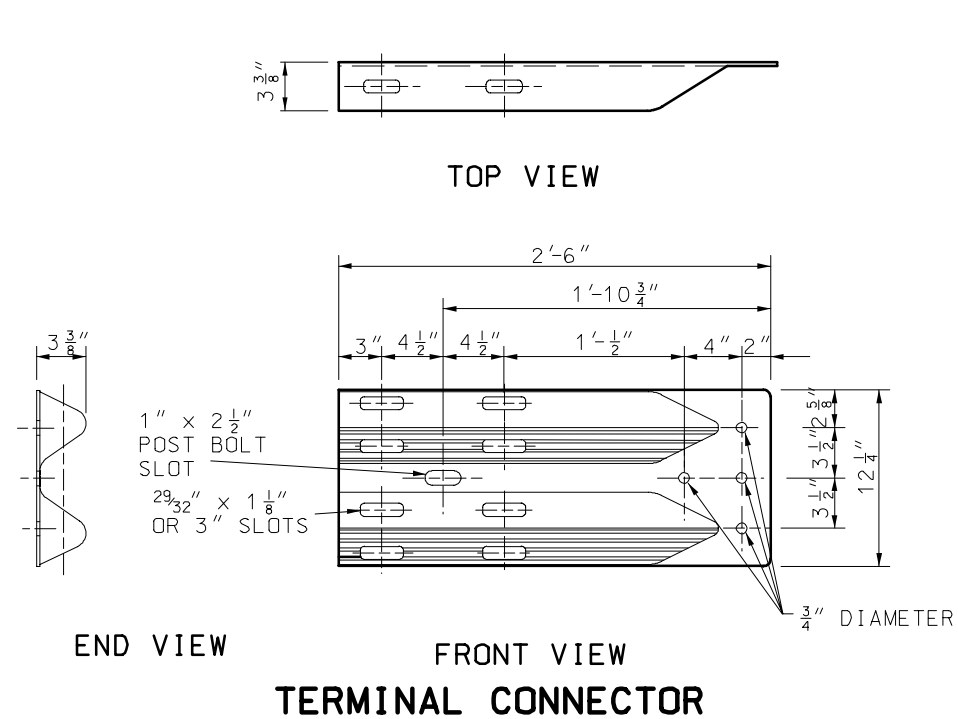
**HOLE PUNCHING DETAIL  
FOR STEEL POST & WOOD OR PLASTIC BLOCKS (1)**

(1) THE OVERALL NOMINAL DIMENSIONS SHOWN SHALL BE MET, ALTHOUGH THE SHAPE OF THE PLASTIC BLOCKS MAY VARY FROM THE SHAPE SHOWN, EXCEPT THE  $\frac{7}{8}$ "  $\pm \frac{1}{4}$ " FLANGE AND THE OVERALL WIDTH DIMENSIONS MAY BE WAIVED IF APPROVED BY PROJECT OPERATIONS.

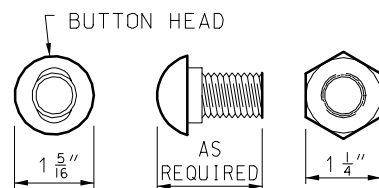


**ALTERNATE DESIGN  
FOR WOOD BLOCK**

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
		<b>GUARDRAIL</b>	
DATE: _____	EFFECTIVE: 01-01-2005	<b>606.00AR</b>	5 16

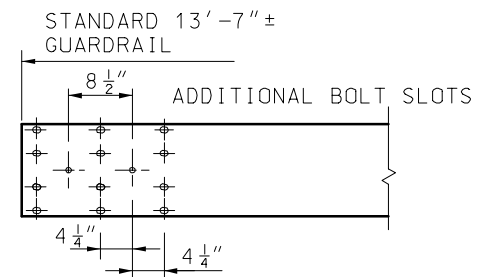


- (1)  $\frac{15}{16}$ " RADIUS
- (2) 2" (TOLERANCE  $+1\frac{1}{4}$ ",  $-1\frac{1}{4}$ " )

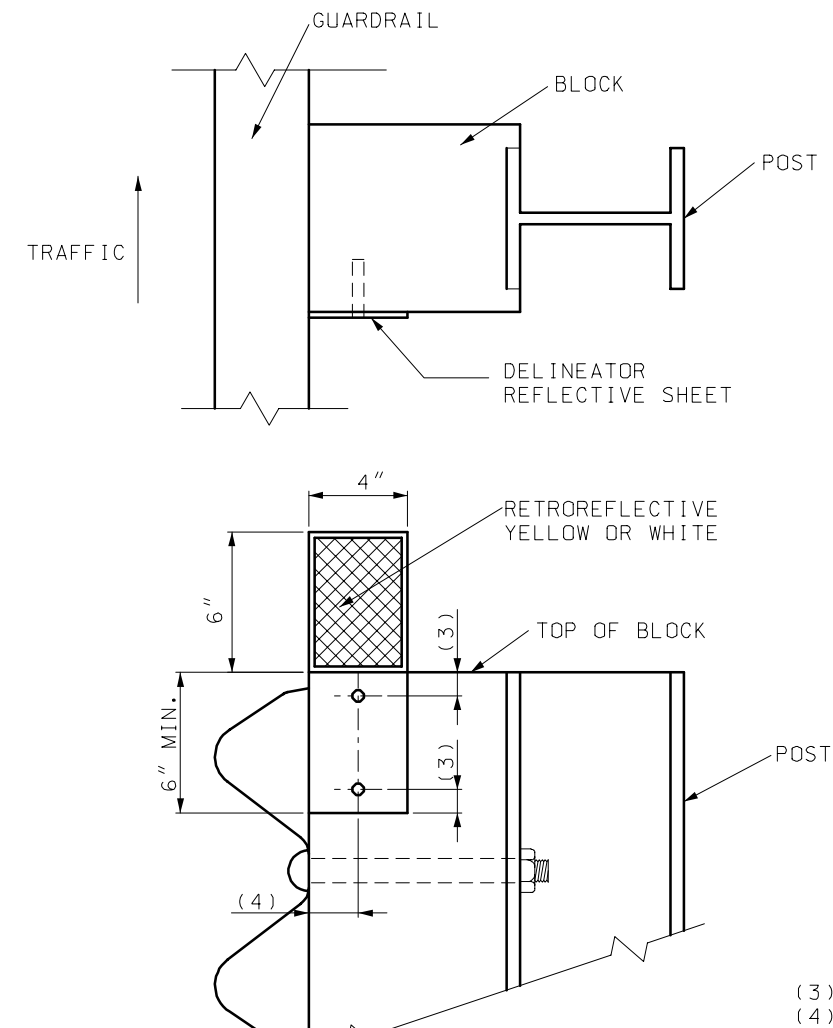


OVAL SHOULD BE OF ADEQUATE HEIGHT, LENGTH & SHAPE TO PREVENT TURNING DURING INSTALLATION OR REMOVAL OF BOLT.

NOTE: PORTIONS OF BEAM WITH UNUSED BOLT SLOTS TO BE LAPPED BEHIND.

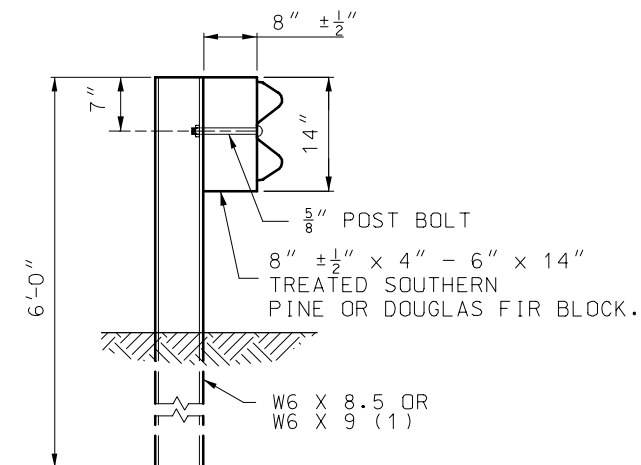


BEAM DETAILS SHOWING LOCATION OF ADDITIONAL BOLT SLOTS NECESSARY TO OBTAIN GUARDRAIL OFFSET.



DELINEATORS SHALL BE AFFIXED WITH 2" (MIN.) LONG X  $\frac{1}{4}$ " DIAMETER BOLTS OR SCREWS. THE DIAMETER OF THE BOLT'S OR SCREW'S HEAD SHALL BE TWICE THE DIAMETER OF THE HOLE, WITH A MINIMUM OF  $\frac{1}{2}$ ". WASHERS SHALL BE USED WITH THE BOLTS AND SHALL HAVE  $\frac{1}{2}$ " DIAMETER HOLES.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<b>GUARDRAIL</b>			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	6/16



SECTION C-C  
FOR WOOD BLOCKS

Technical drawing of a column base plate. The drawing shows a side view of a base plate with a total height of 6'-0" and a total width of 21". The base plate is divided into two main sections: a top section of 1'-9" and a bottom section of 1'-9". The top section is labeled "8" x 6" x 21" TREATED SOUTHERN PINE OR DOUGLAS FIR BLOCK". The bottom section is labeled "W6 x 8.5 OR W6 x 9 (1)". The base plate is supported by a foundation, indicated by hatching. The drawing also shows a "BOLT" and a "5/8" x 8" dimension.

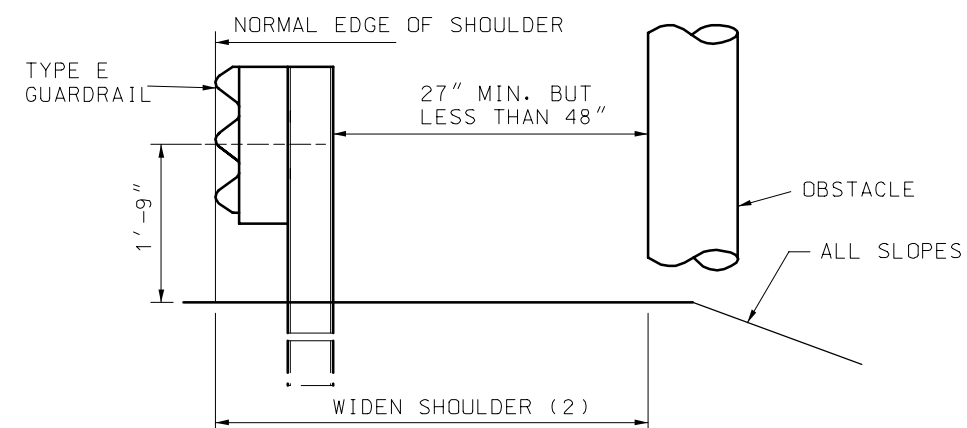
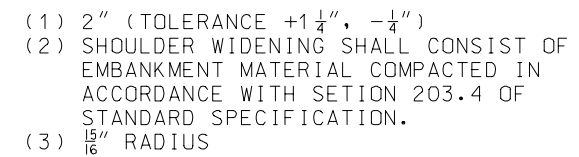
SECTION B-B  
FOR WOOD BLOCKS

## HOLE PUNCHING DETAIL

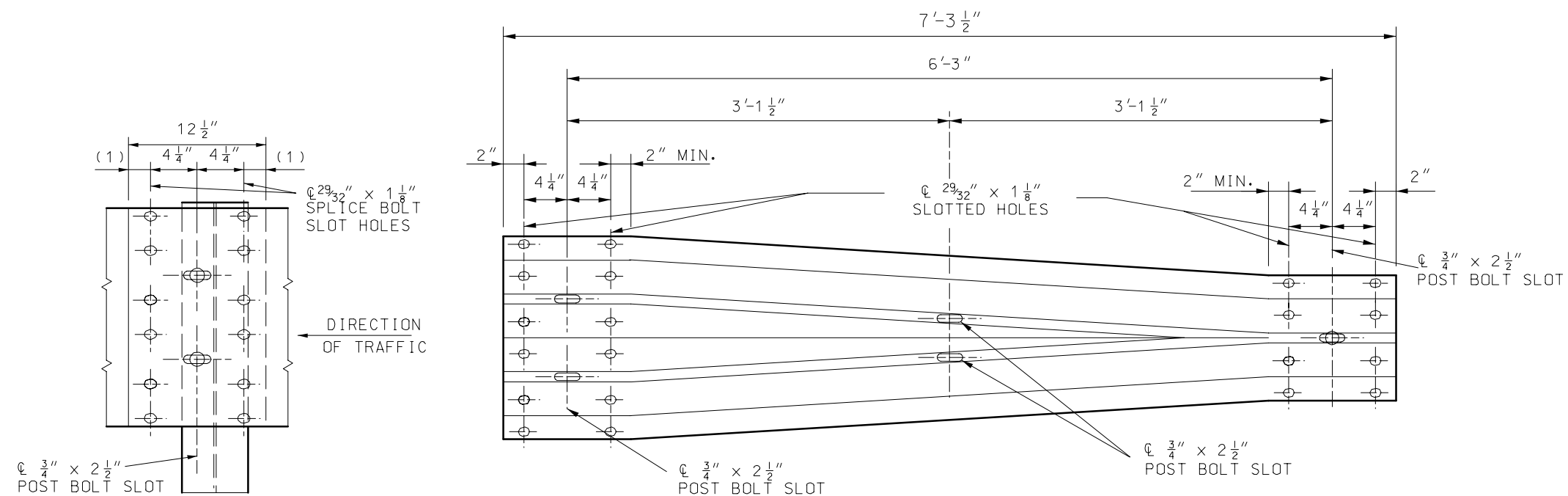
FOR STEEL POST & WOOD OR PLASTIC BLOCKS

FOR DETAILS NOT SHOWN, SEE OTHER SHEETS OF THIS  
DRAWING.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
	<p style="text-align: center;"><b>GUARDRAIL TYPE E</b></p>		
DATE: _____	EFFECTIVE: 01-01-2005	<b>606.00AR</b>	<div style="text-align: right;">7</div> <div style="text-align: right;">16</div>



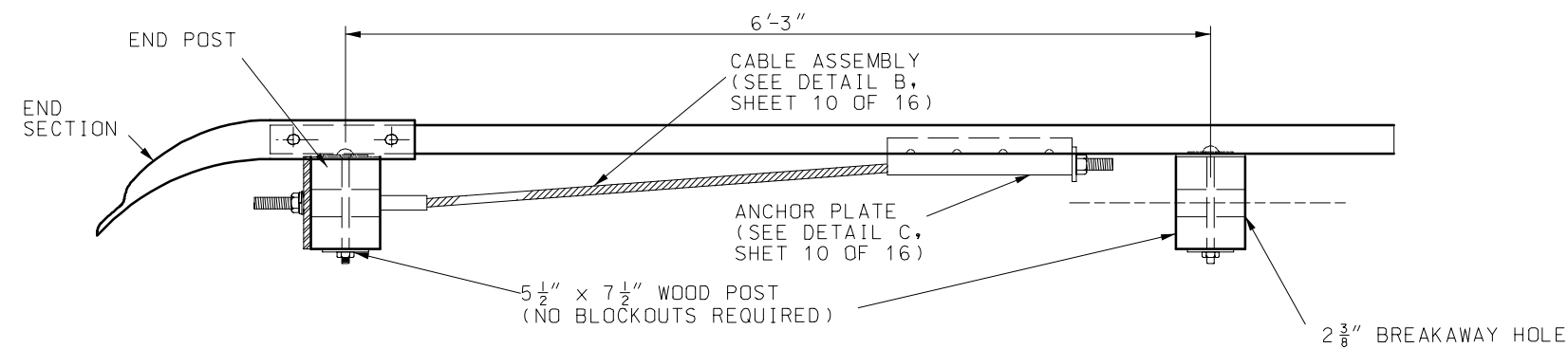
USE 25 FEET OF TYPE E GUARDRAIL PRECEDING THE OBSTACLE, AND THROUGH THE LIMITS OF THE OBSTACLE WHEN THE ABOVE CONDITION EXISTS.



## ELEVATION OF TRANSITION SECTION

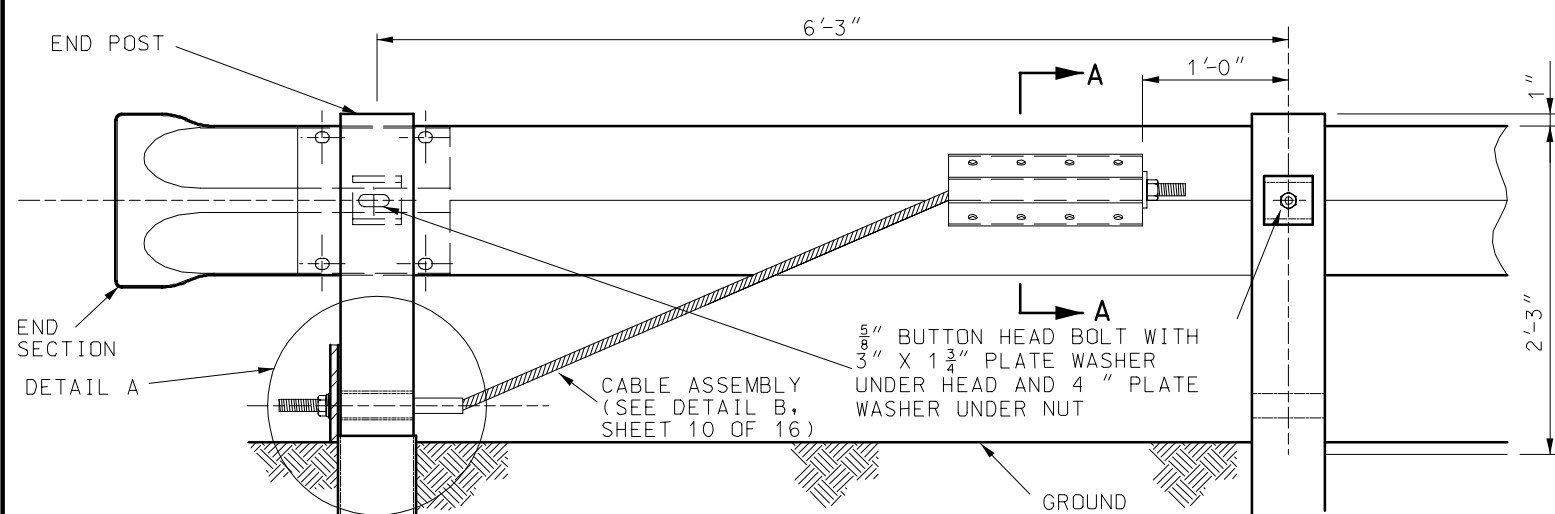
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
	<div>GUARDRAIL TYPE E</div>		
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	<div>8</div> <div>16</div>





NOTE: SEE SHEET 6 OF 16 FOR  
DETAILS OF END SECTION.

PLAN

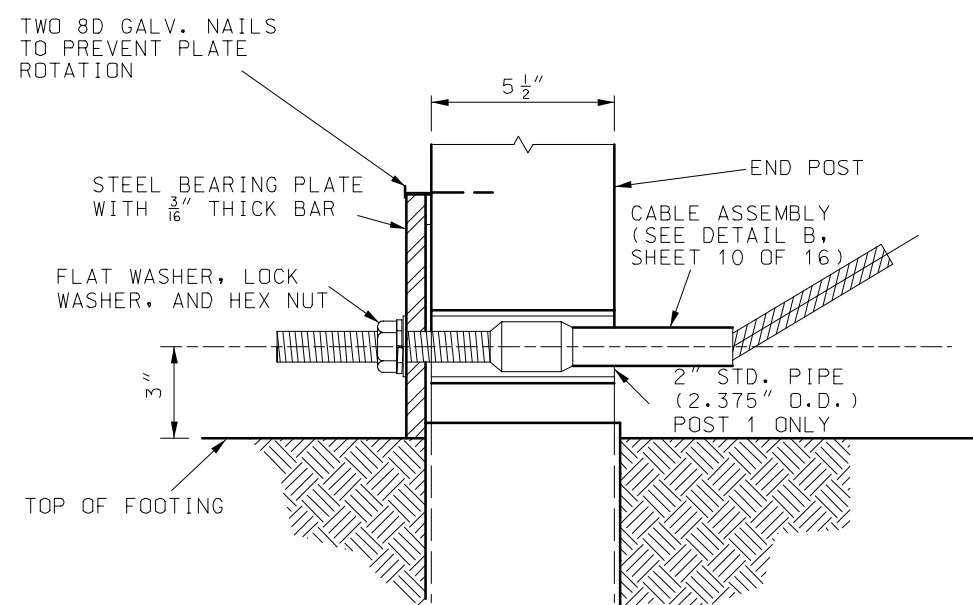


POST 1

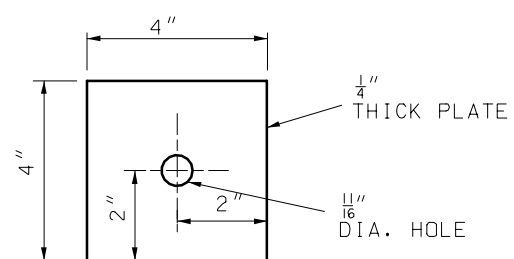
ELEVATION  
(BACK SIDE)

POST 2

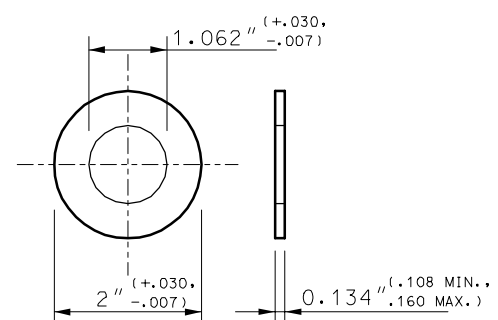
END ANCHOR DETAILS



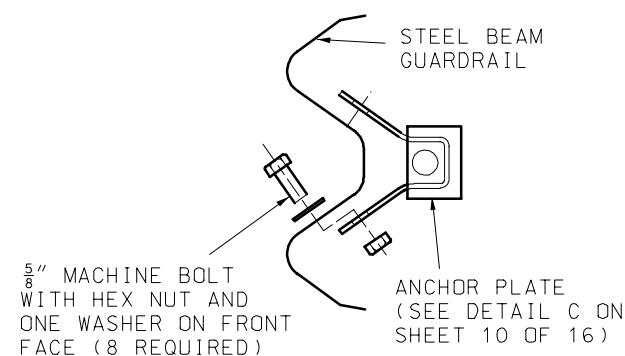
DETAIL A  
(END POST DETAIL)



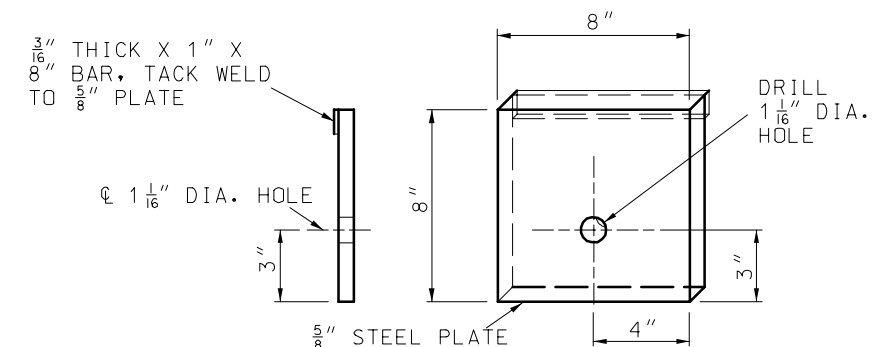
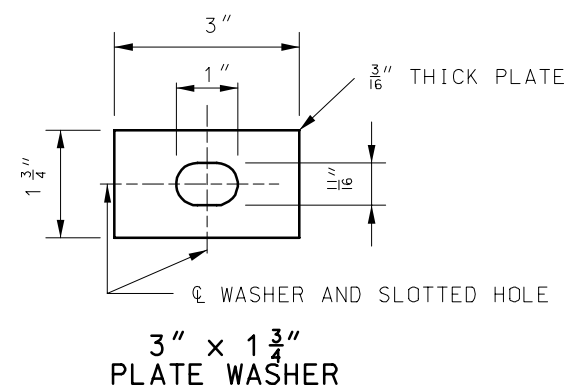
4" PLATE WASHER



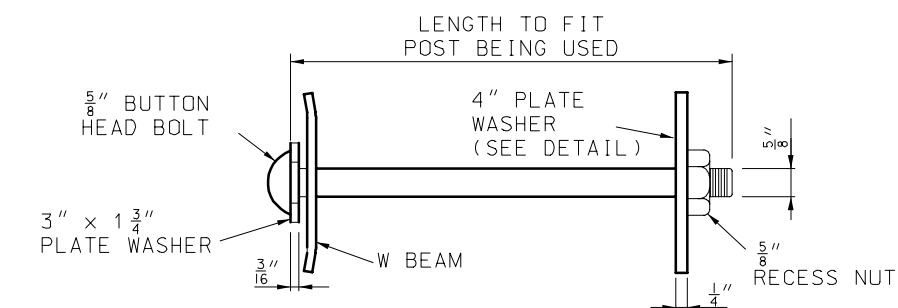
TYPE A WASHER



SECTION A-A



DETAIL OF  
STEEL BEARING PLATE



POST BOLT ASSEMBLY

#### GENERAL NOTES:

END ANCHOR DETAILS SHOWN SHALL BE USED ONLY ON  
DOWN STREAM ENDS OF GUARDRAIL WHEN AN END ANCHOR  
IS REQUIRED.

THE DETAILS SHOWN ARE FOR AN END ANCHORAGE SYSTEM  
FOR GUARDRAIL. GUARDRAIL AND POSTS ARE PAID FOR  
SEPARATELY.

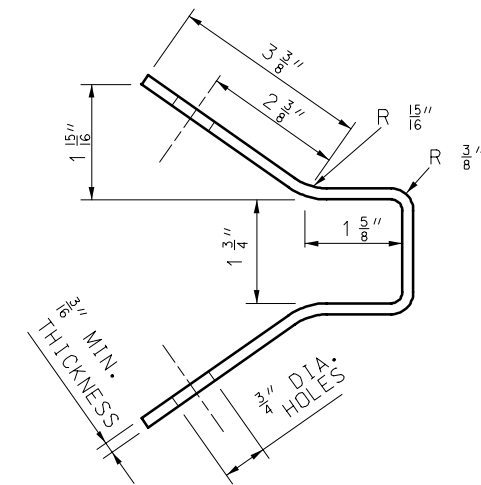
CABLE ASSEMBLY AND ANCHOR PLATE SHALL BE SUBJECT TO  
APPROVAL BY THE ENGINEER AND SHALL HAVE A MINIMUM  
BREAKING STRENGTH OF 20 TONS.

ALL FITTINGS AND HARDWARE REQUIRED SHALL BE  
GALVANIZED AFTER FABRICATION, SEE SECTION 1040  
STANDARD SPECIFICATION.

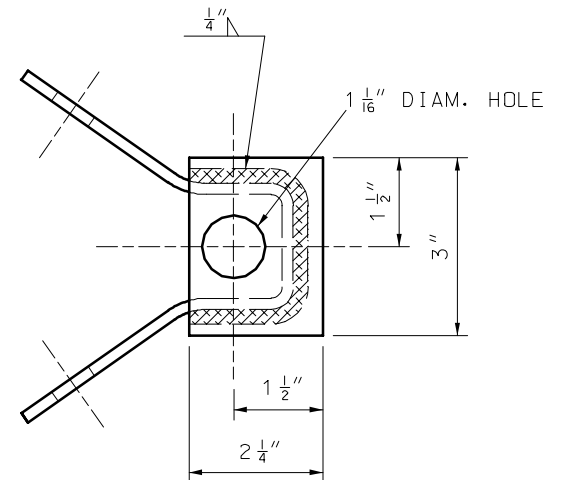
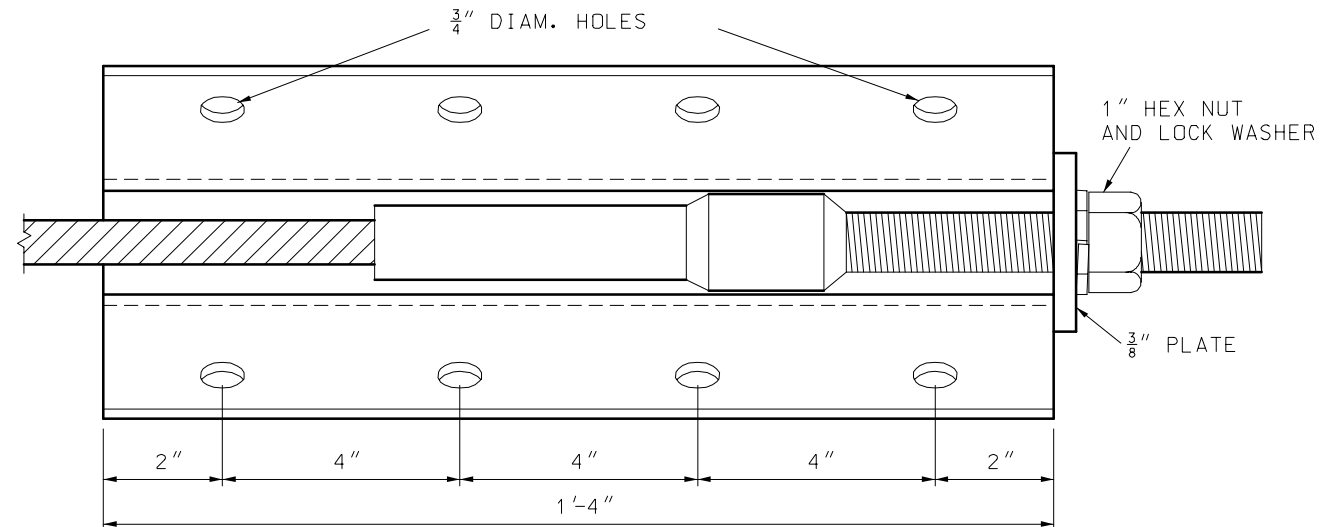
WOOD POSTS 1 AND 2 SHALL BE 5 1/2" X 7 1/2".

SEE SECTION 1050 STANDARD SPECIFICATIONS FOR WOOD  
POST.

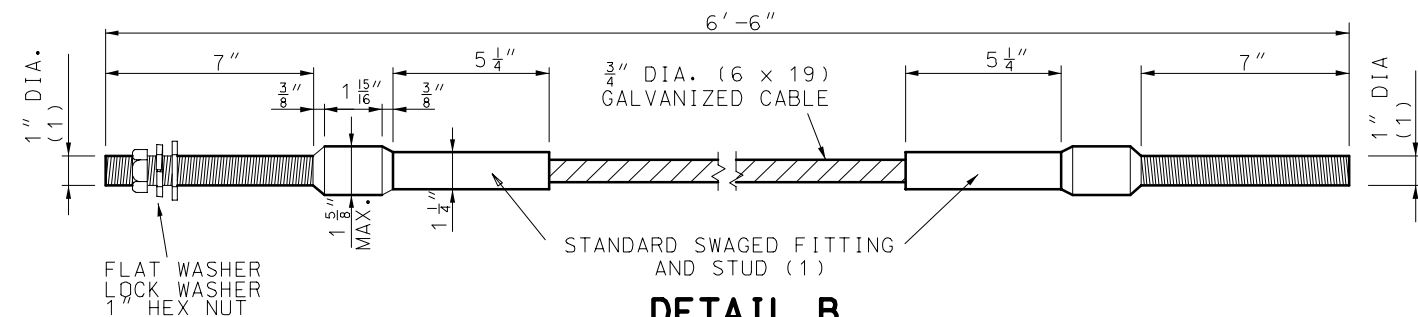
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<b>GUARDRAIL END ANCHOR DETAILS</b>			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	9/16



FABRICATION DETAIL



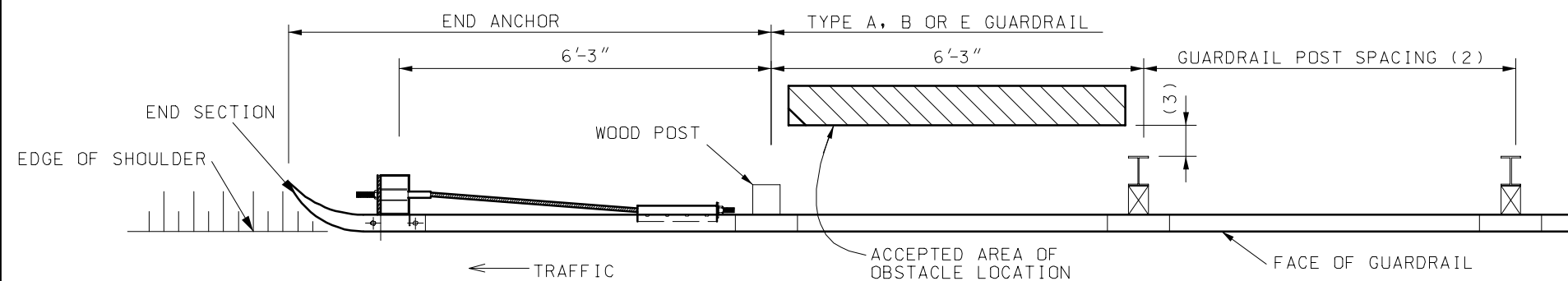
END VIEW



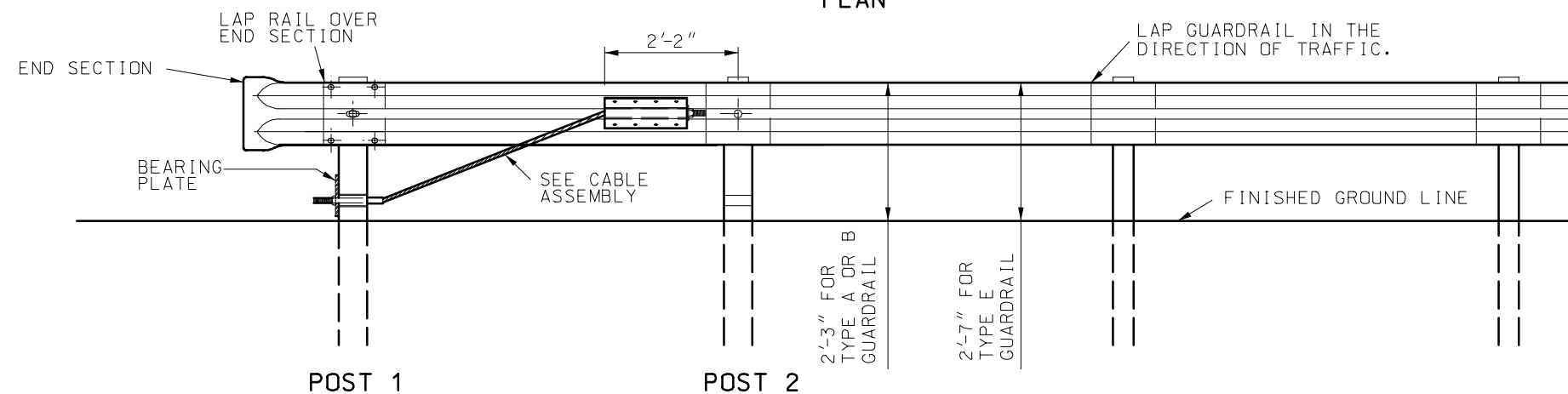
DETAIL B  
(CABLE ASSEMBLY)

DETAIL C  
ASSEMBLED VIEW  
(ANCHOR PLATE)

- (1) STUD, THREADED ENTIRE LENGTH.
- (2) 6'-3" SPACING FOR TYPE A OR B GUARDRAIL; 3'-1 1/2" SPACING FOR TYPE E GUARDRAIL.
- (3) 27" MINIMUM BUT LESS THAN 4' FOR TYPE E GUARDRAIL; 4' MINIMUM FOR TYPE A GUARDRAIL.

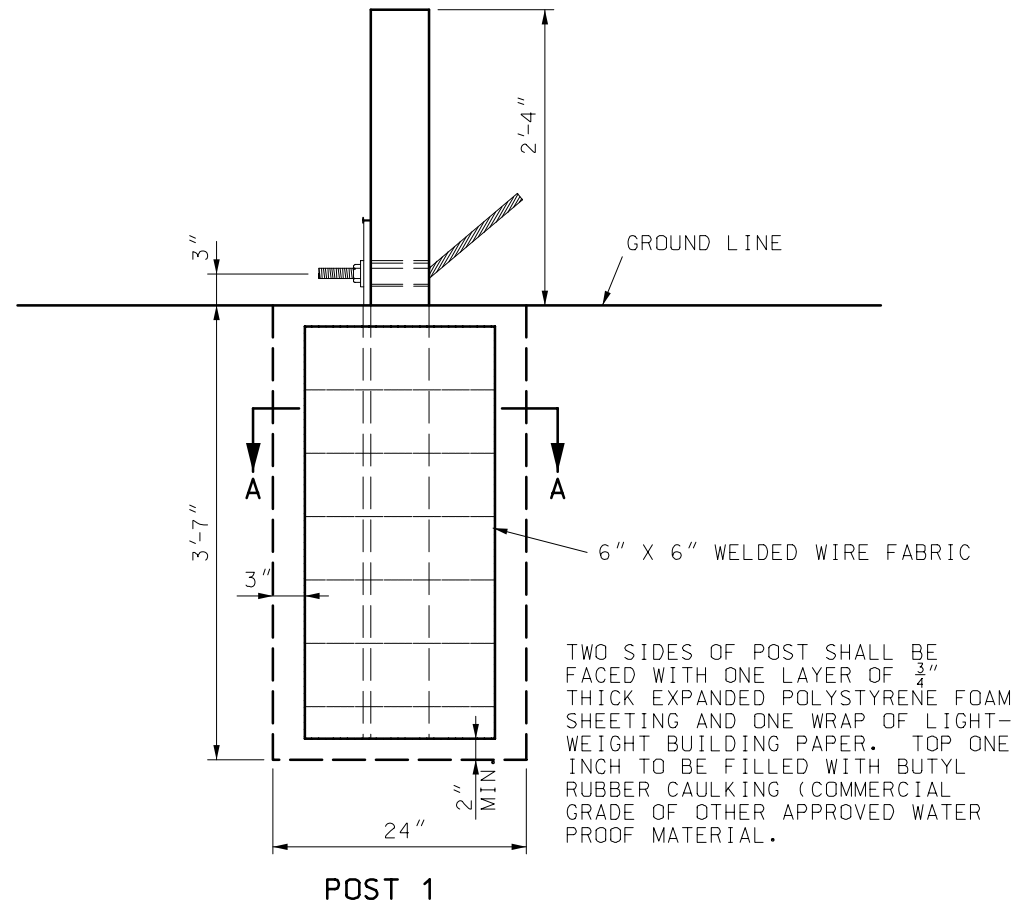


PLAN

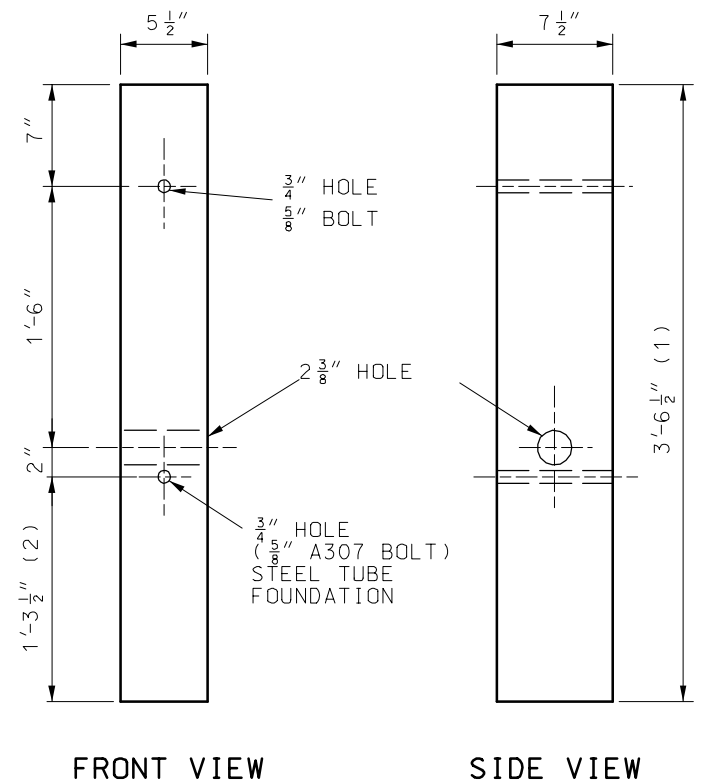
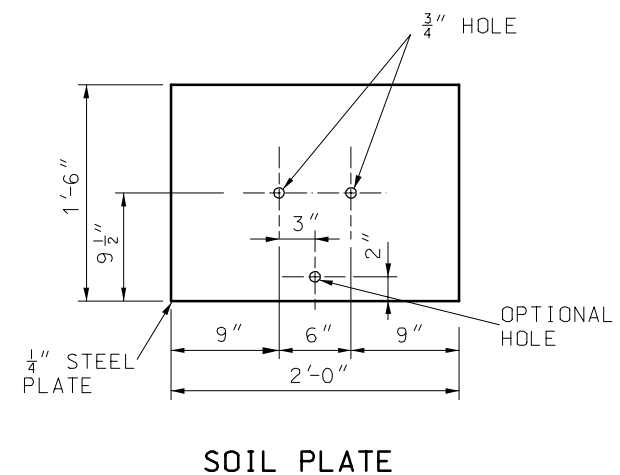
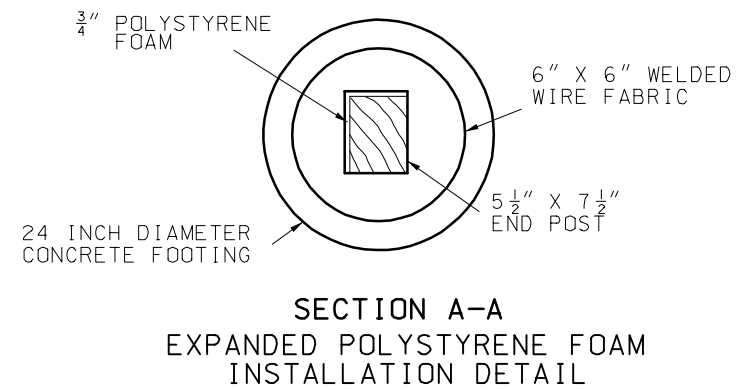


ELEVATION  
END ANCHOR

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
GUARDRAIL END ANCHOR DETAILS			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	10/16

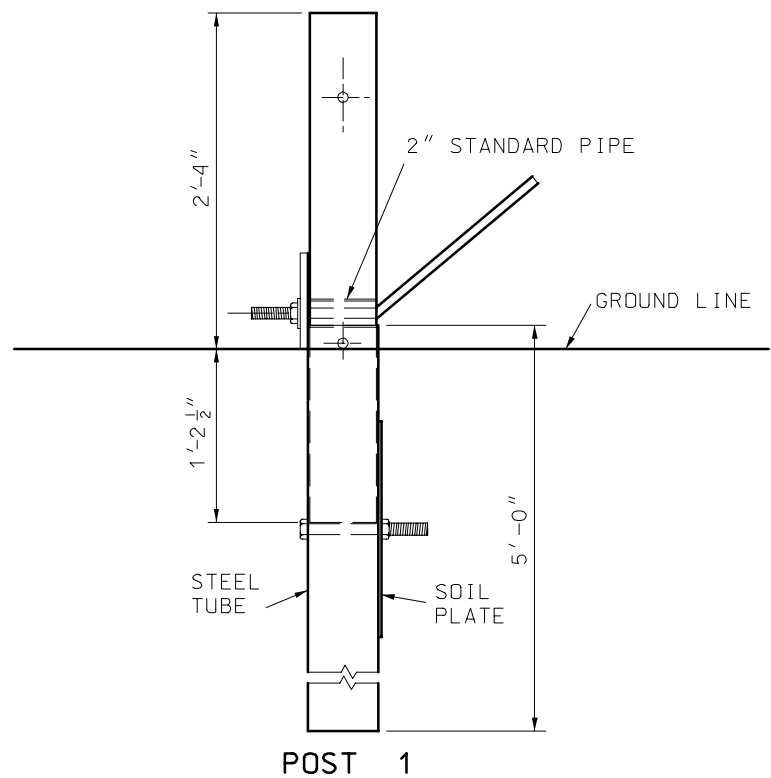


CONCRETE FOUNDATION FOR END ANCHORS



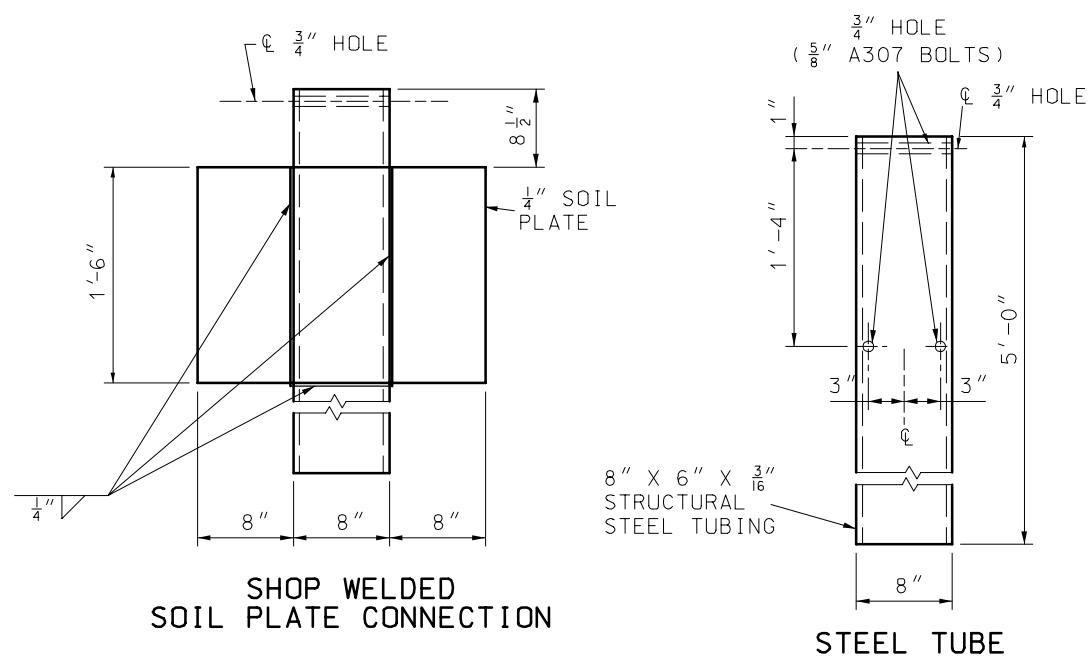
WOOD BREAKAWAY POST  
SEE SECTION 1050

- (1) 5'-9 1/2" FOR CONCRETE FOUNDATION ALTERNATE.
- (2) 3'-6 1/2" FOR CONCRETE FOUNDATION ALTERNATE.



STEEL TUBE FOUNDATION FOR END ANCHORS

BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M232, OR THEY MAY BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M232 CLASS C.



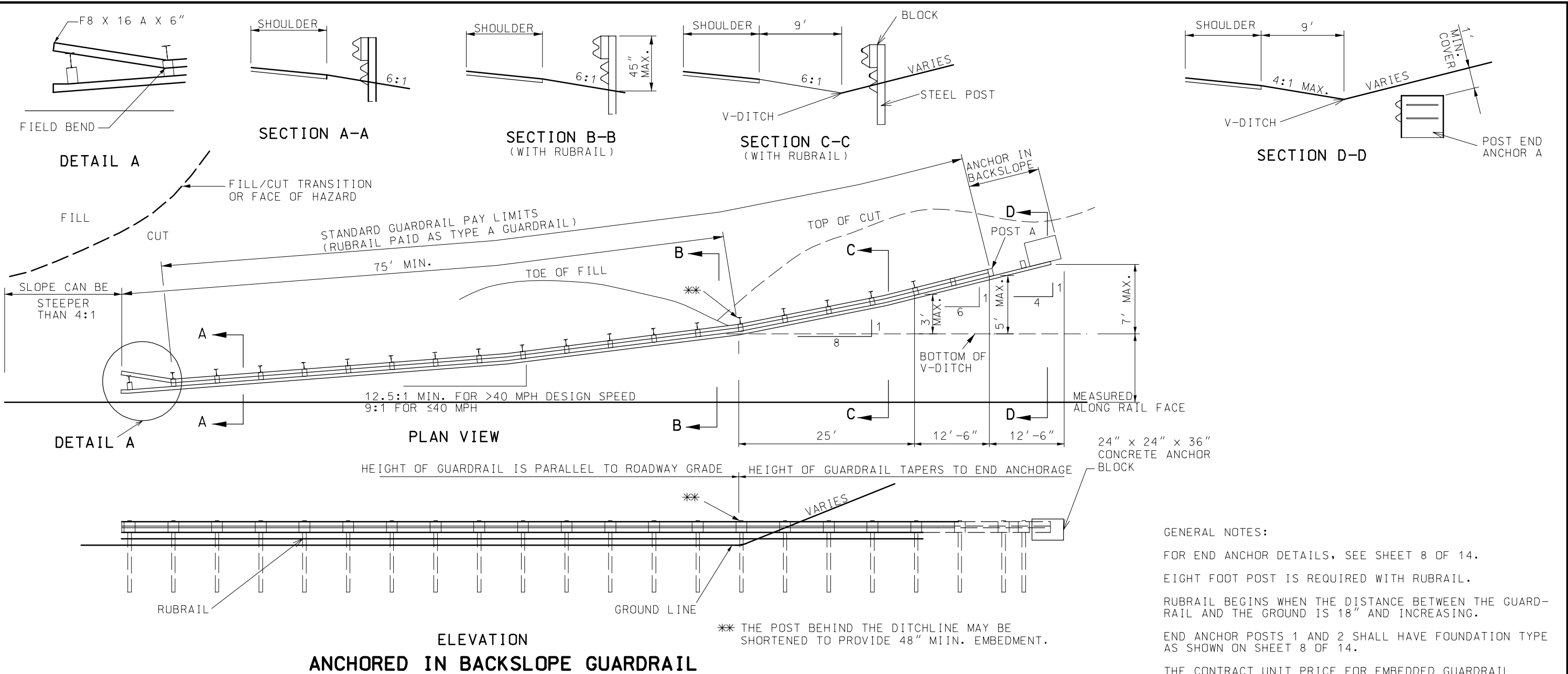
GENERAL NOTES:

THE CONTRACTOR HAS THE OPTION TO INSTALL WOOD POST 1 AND 2 IN STEEL TUBE OR CONCRETE FOUNDATION.

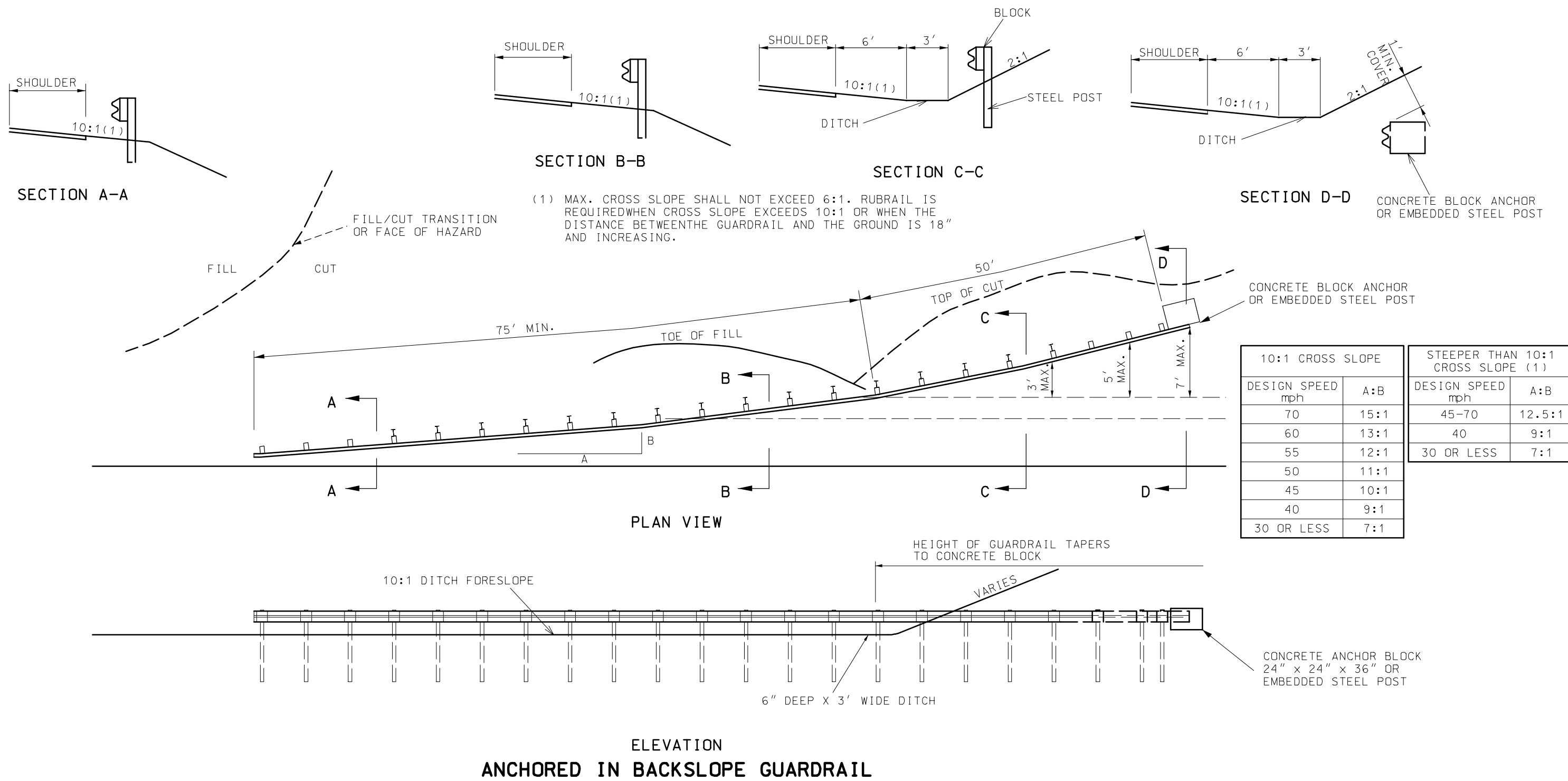
TRIMMING OF WOOD POST MAY BE NECESSARY FOR STEEL TUBE FOUNDATION.

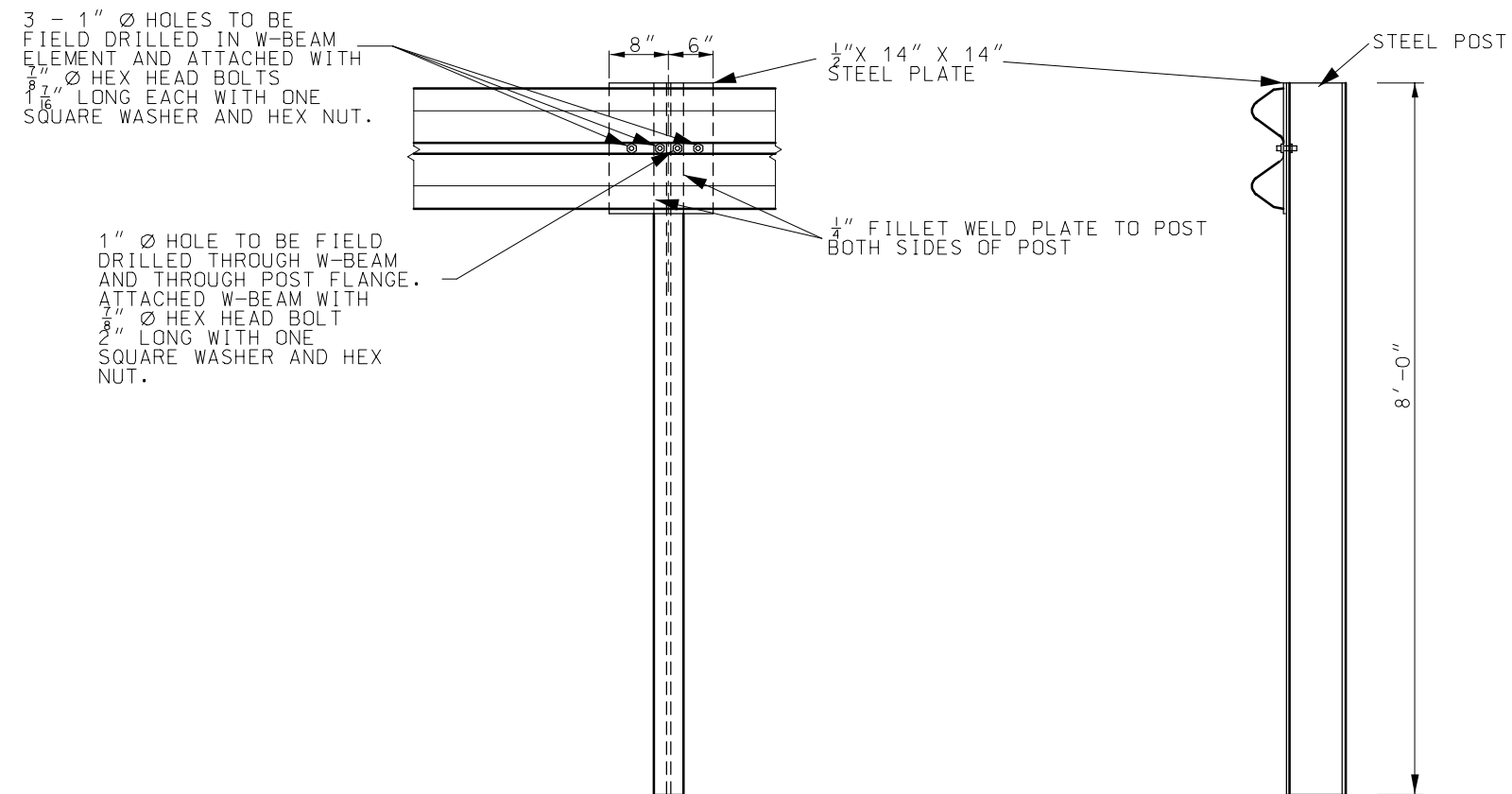
STEEL TUBE FOUNDATIONS SHALL BE DRILLED AND BACK-FILLED WITH A SUITABLE MATERIAL WHEN THE SOIL PLATE IS BOLTED, AS SHOWN, TO THE STEEL TUBE. STEEL TUBE FOUNDATION MAY BE DRIVEN WHEN THE SOIL PLATE IS WELDED, AS SHOWN, TO THE STEEL TUBE.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
GUARDRAIL			
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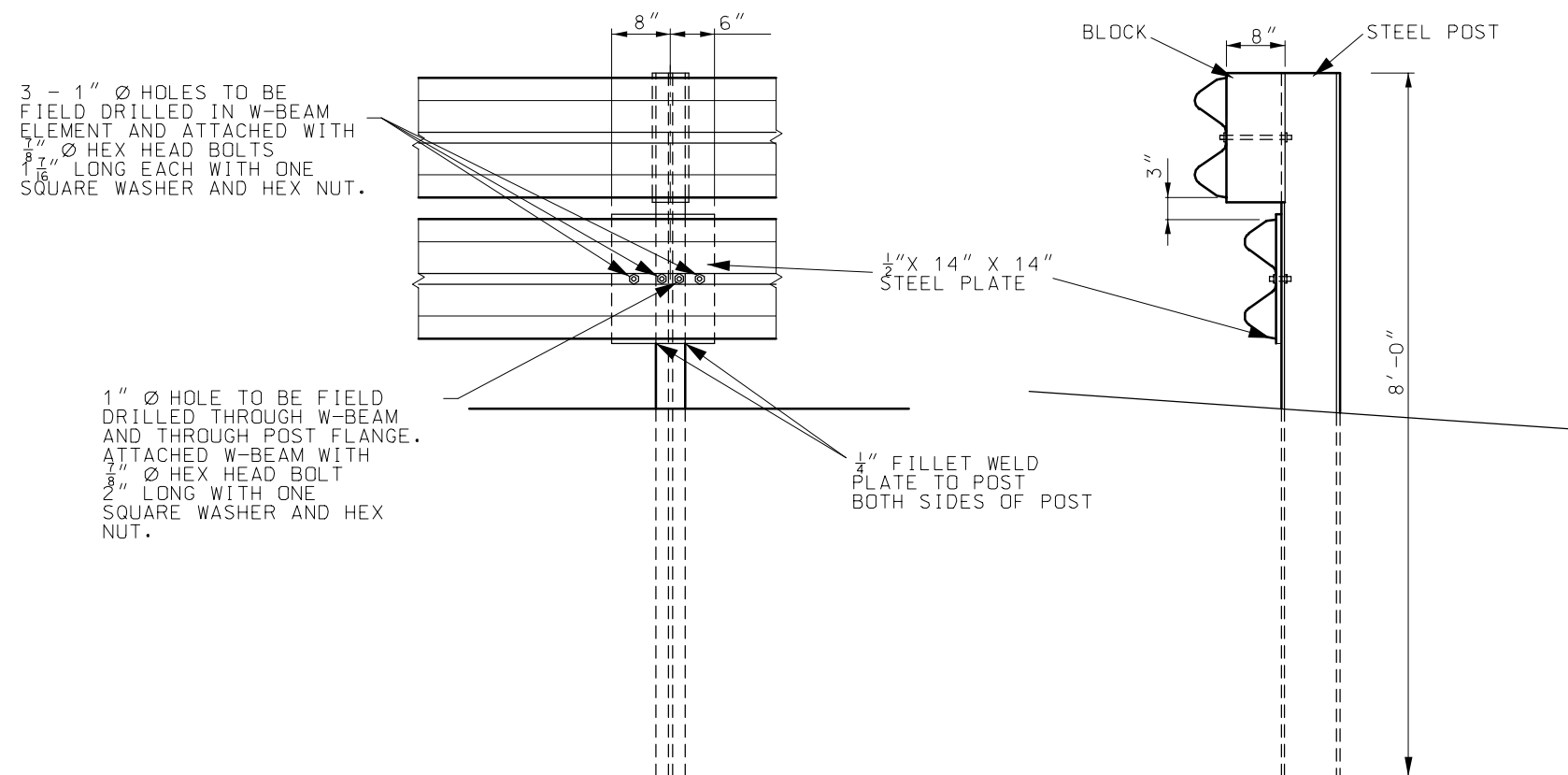


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
<b>GUARDRAIL</b> ANCHOR IN BACKSLOPE WITH V-DITCH STEEPER THAN 10:1, 4:1 MAX. FORESLOPE			
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	12/16





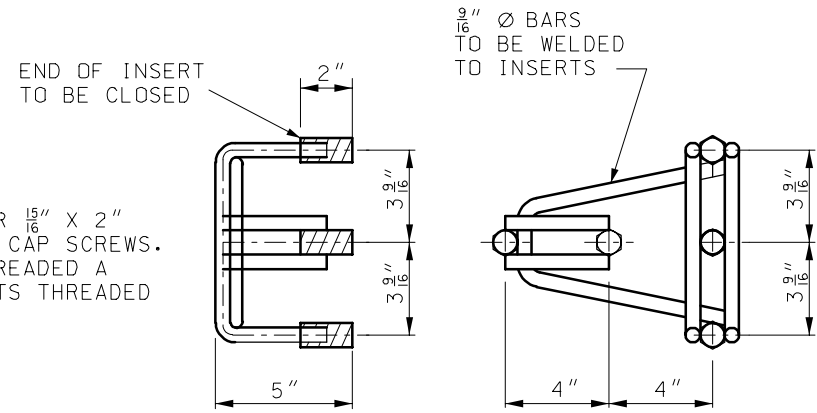
EMBEDDED STEEL POST



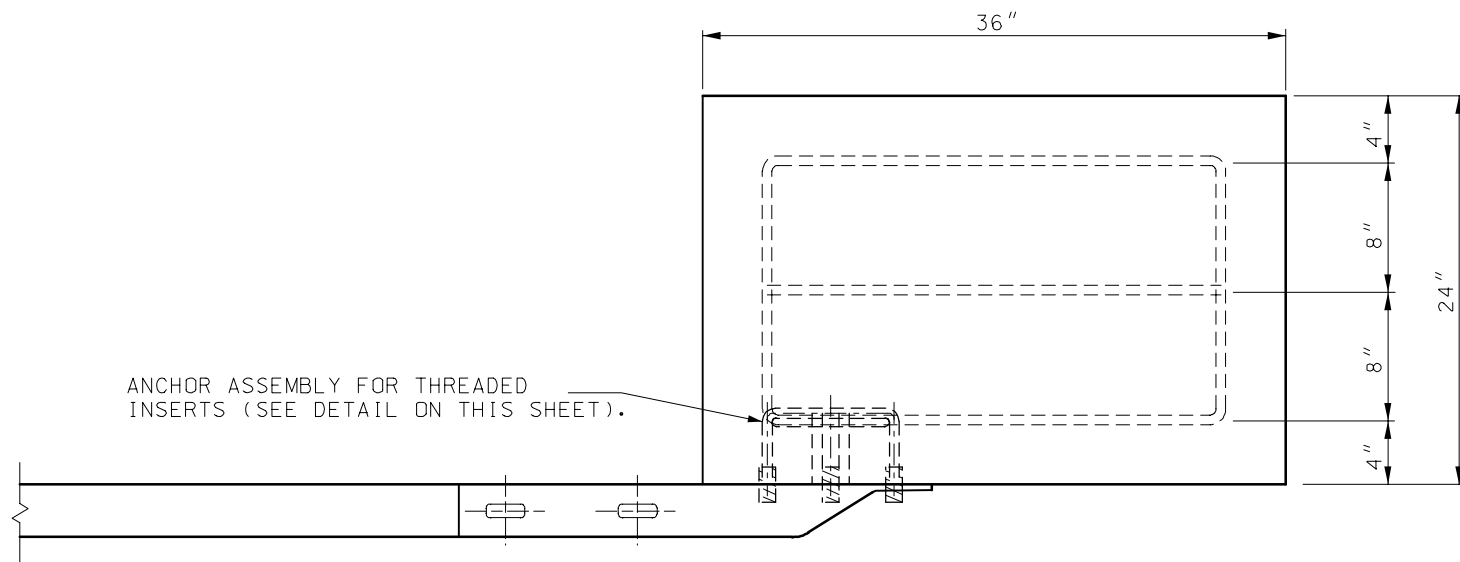
SPECIAL RUBRAIL TO POST CONNECTION AT POST A

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
		<b>GUARDRAIL</b> ANCHORED IN BACKSLOPE END ANCHORAGE DETAILS EMBEDDED STEEL POST OPTION	
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	14/16

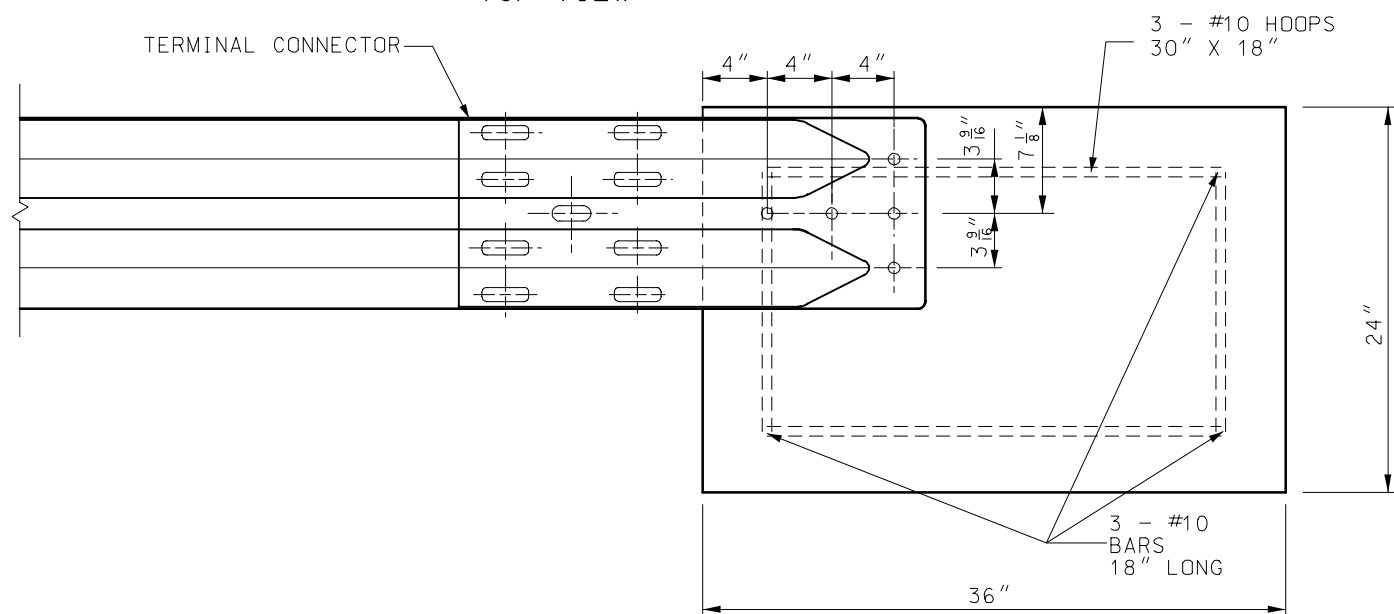
THREADED INSERTS FOR  $\frac{15}{16}$ " X 2" GALVANIZED HEX HEAD CAP SCREWS. CAP SCREWS TO BE THREADED A MINIMUM  $1\frac{7}{8}$ ". INSERTS THREADED MINIMUM OF  $1\frac{3}{4}$ ".



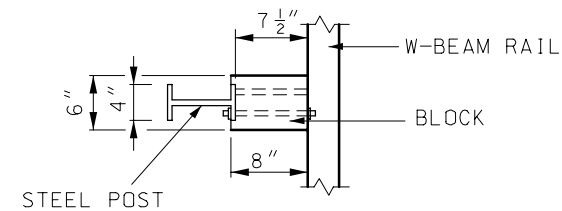
**CONCRETE BLOCK ANCHOR  
ANCHOR ASSEMBLY**



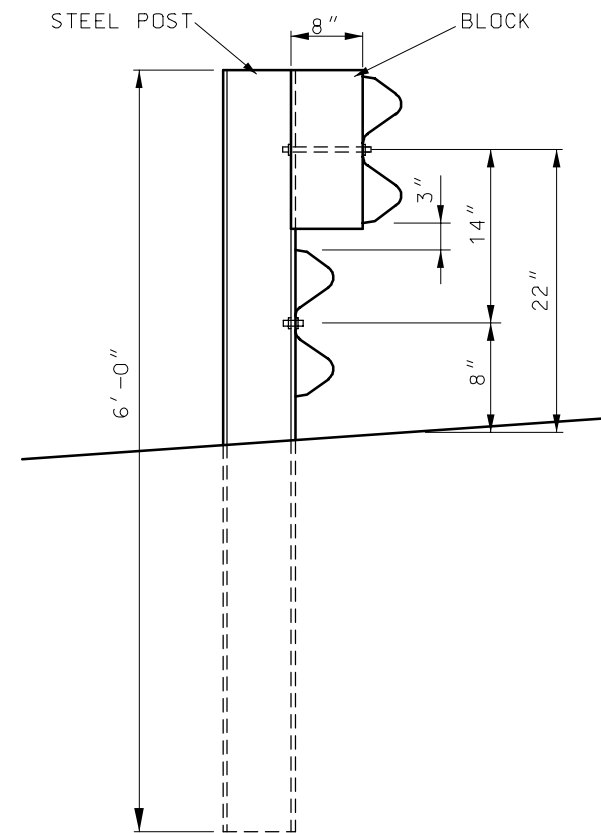
**TOP VIEW**



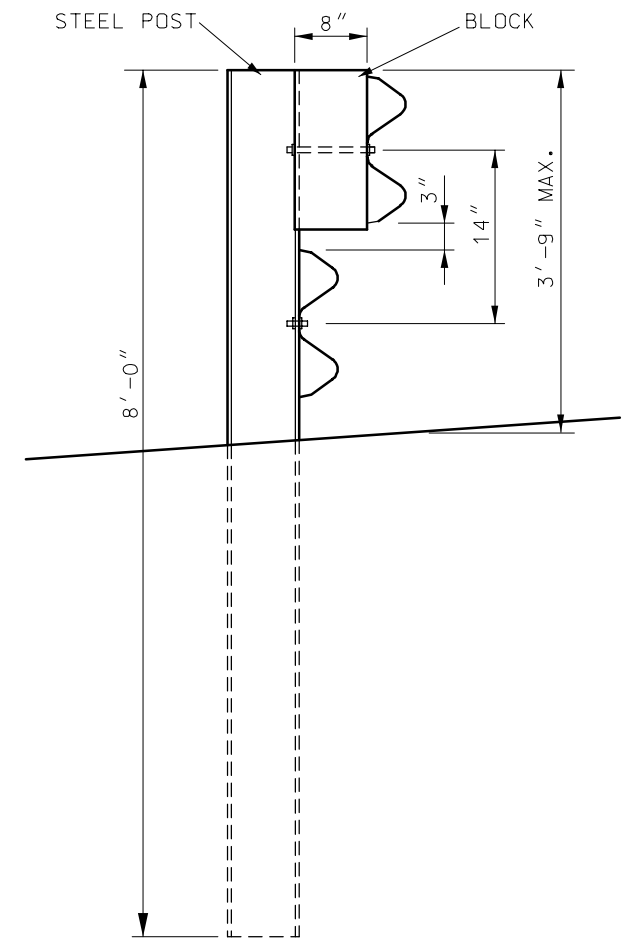
**ELEVATION  
CONCRETE BLOCK ANCHOR  
(24" X 24" X 36")**



**PLAN**

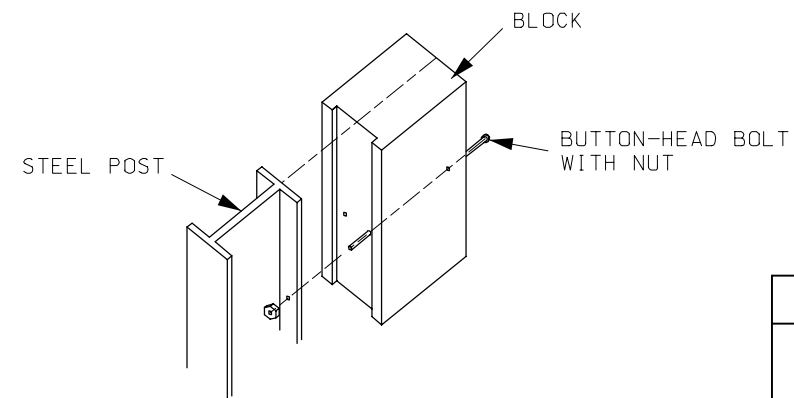


**ELEVATION OF 6' POST**



**ELEVATION 8' POST**

**STEEL POST AND BLOCK DETAIL**



**EXPLODED VIEW**

(RAIL AND WASHER NOT SHOWN)

MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION

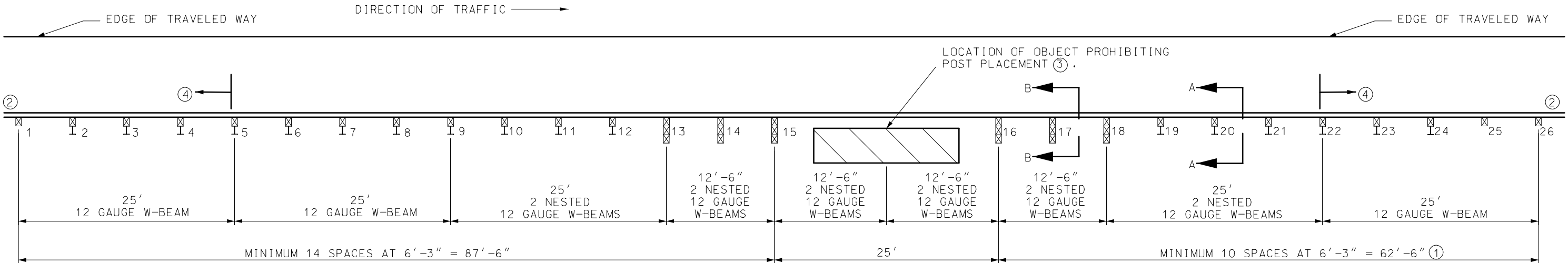
**GUARDRAIL  
ANCHORED IN BACKSLOPE  
GENERAL DETAILS**

DATE: \_\_\_\_\_

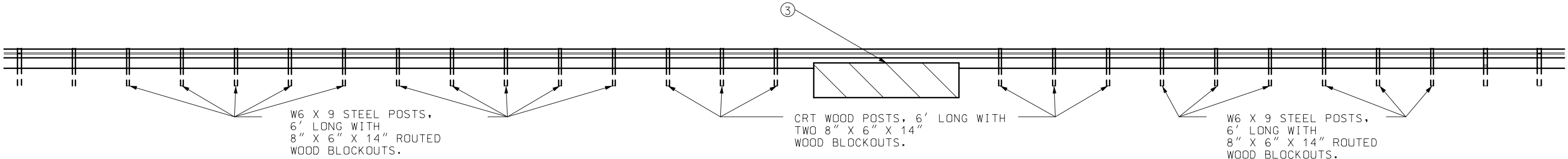
EFFECTIVE: 01-01-2005

**606.00AR**

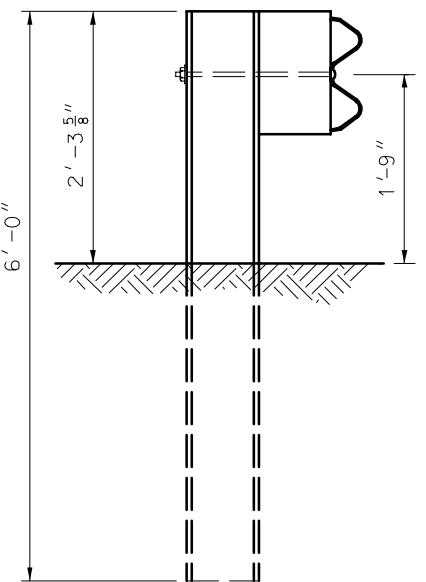
15  
16



PLAN

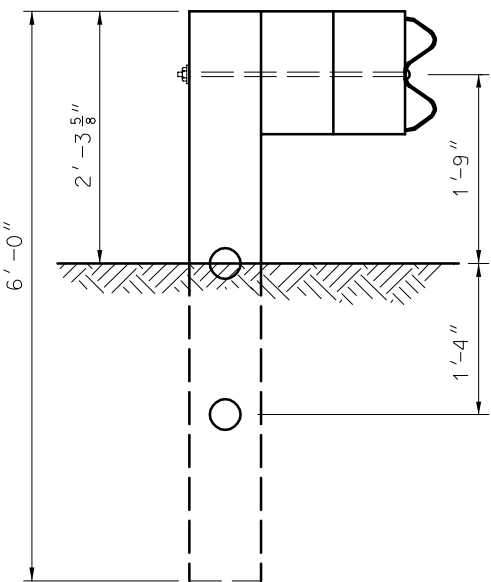


ELEVATION



SECTION A-A

W6 X 9 STEEL POSTS, 6' LONG WITH 8" X 6" X 14" ROUTED WOOD BLOCKOUTS POSTS 3 THROUGH 12 AND 19 THROUGH 24.



SECTION B-B

CRT WOOD POSTS, 6' LONG WITH TWO 8" X 6" X 14" WOOD BLOCKOUTS POSTS 13 THROUGH 18.

- ① IF LOCATED WITHIN THE CLEAR ZONE OF A TWO-WAY ROADWAY, THE MINIMUM LENGTH IS 87'-6".
- ② ADDITIONAL GUARDRAIL AS REQUIRED, INCLUDING END TREATMENT.
- ③ THE POST MAY BE SKIPPED DUE TO THE PRESENCE OF AN OBSTACLE SUCH AS A CULVERT.
- ④ PLACE END TREATMENT NO CLOSER TO THE SKIPPED POST THAN POSTS 5 AND 22.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
		<b>GUARDRAIL</b> SKIPPING A POST (MODIFIED LONG-SPAN GUARDRAIL SYSTEM)	
DATE: _____	EFFECTIVE: 01-01-2005	606.00AR	16/16